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E-BANKING: CHALLENGES AND PROSPECTS WITH SPECIAL REFERENCE TO NATIONALIZED BANKS IN DAKSHINA KANNADA DISTRICT

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1. INTRODUCTION

The global information infrastructure is rapidly evolving, allowing for the growth of electronic commerce on a global level. In which, internet's practical universal connection has made it a useful commercial tool. These advances have given rise to a new sort of economy, which many refer to it as the ***'Digital Economy'***. This quickly expanding economy is introducing swiftly changing technology, increasing information intensity in all areas of industry, and establishing virtual supply chains as well as new types of businesses and service delivery channels (Shah & Clarke, 2009). The increasing digitalization of the economy and society is changing the ways people act and interact. One of the distinguishing features of various digital transformations has been the exponential growth in machine-readable information, or digital data, over the internet. Such data are core to all fast-emerging digital technologies, such as Data Analytics, Artificial Intelligence (AI), Blockchain, Internet of Things (IoT), Cloud Computing and all Internet-Based Services and they have become a fundamental economic resource. The COVID-19 pandemic has accelerated digitalization processes, as more and more people have continued, to the extent possible, with their activities through online channels-for example, for working, studying, communicating, selling and buying, or entertainment (Digital Economy Report, 2021). The highly competitive environment in the financial industry has put pressure on innovators and providers to design and implement alternate distribution methods. However, access to technology, evolving consumer expectation, increasing urbanization, financial inclusion and domestic consideration have revolutionized the global payment landscape. In the advent of technology is transferming it structure,work culture, system and procedure. In this connection, financial transactions are at the forefront of technology.

A large amount of money must be moved quickly across the globe; transactions must be carried out in the physical world without using actual money. On the other hand, customers want to do banking and other financial activities from the convenience of their own homes and with as much ease as possible. This has resulted in the emergence, growth, and expansion of alternative delivery channels, which are rapidly displacing traditional banking channels such as brick-and-mortar (branch-based) banking and in this pressure fast development use the alternate delivery channels has grown and enforce to introduced online banking, it is commonly known as "Electronic Banking" (Uppal R. K., 2012; Daniel & Storey, 1997).

Every segment of society is rapidly adopting modern information technology and everyone has quick access to their banking operations due to the internet or electronic banking services. These banking activities may include but are not limited to, checking an account balance, money transactions between a user's account, transferring money from a user's account to another user's account, and checking account history. Some banks additionally provide services like stock market trading and submitting standardised accounting payment files for third-party bank transfers (Claessens *et al*., 2002).

Apart from the recent abrupt shift in technology usage, the banking industry has undergone a major transformation in the last few years. Banks have several difficulties, but they also have a wide range of opportunities. Worldwide banking has been fundamentally transformed by several financial advances, including ATMs, Plastic Cards, Point-of-Sale (POS) Terminals, the Internet, and Mobile Banking. Advanced electronic payment systems such as RTGS and NEFT have also sped up and connected transactions between businesses and individual accounts. A key contributor to e-banking is developing and utilizing alternative delivery channels (IIBF, 2016). Presently, information technology is driving the transformation of banking. It is effectively promoting e-banking. Banks will need to focus more on the needs of the customer by providing a wide range of products through various delivery channels, developing their ability to increase assets and liabilities in accordance with risk and return, and making technology investments for better management systems, product development, risk management, fund management, and customer services. The key to overcoming these obstacles is putting the required processes, competent personnel, training programmes, equipment, workforce, and all-out initiatives to inspire and retain knowledgeable personnel. However, more creative solutions are still required for the banks to effectively address problems and take advantage of new opportunities (Bhai, 2018).

At this point of view, considering these transformations many researchers have conducted various studies pertaining to e-banking, with respect to customer satisfaction, quality of services, customer loyalty and so on at global and national level which is further explained along with its emergence to address the low focused and uncovered areas.

2. STATEMENT OF THE PROBLEM

In a short time, the internet has gone from being a secondary resource to being central to how we interact with one another and how we pass the time outside of work. E-banking is one of the most significant developments brought about by technology. E-banking eliminates the requirement for the majority of bank visits. Even though, according to Locket & Littler (1997), physical banks ensure the security of their clients' funds by assuring them that their banks have ample resources. According to research, electronic banking has been accessible in the United Kingdom since the early 1980s. It is unclear if all clients need or prefer electronic banking (Daniel & Storey, 1997). The fast evolution of technology makes it challenging for the consumer and the bank to decide the best strategy. While attempting to connect new channels with old channels, new challenges occur. For these reasons, academic study on this newly emergent distribution route is required (Daniel & Storey, 1997). As a result of the increased use of the internet and technical devices, researchers are now paying particular attention to electronic payments. As shown by Glavee-Geo *et al.* (2017) and Singh & Srivastava (2020), previous research has explored the factors that impact the adoption of e-banking. Although e-banking services provide users with remarkable advantages, the acceptance rate is lower than expected and is still in the adoption phase (Shankar *et al*., 2020). Thus, it is essential to investigate the causes of low acceptance and the most effective methods for promoting e-banking. The adoption of e-banking not only helps the banks align their offerings to the constantly evolving customer needs and developments in technology but also replaces some of four traditional bank functions, thereby reducing significant overheads associated with the bank branches.

As more Indian banks consider cutting-edge solutions to make customers' banking experiences more practical, effective, and efficient, it is even more crucial to determine customers' knowledge of and utilisation of present electronic banking services as well as their happiness with them. Under the electronic banking platform of banks, a variety of services are made available to users. This includes Internet Banking, Mobile Banking, Phone Banking, Electronic Clearing Services (Debit and Credit), Cheque Truncation System, Cheques, Automated Teller Machine (ATM) Cards, Credit Cards, and so on. In today's fast-paced world, all of these banking services are designed to make it easier for clients to complete their financial transactions with participating financial institutions. Yet, for consumers to reap the advantages of all of these services,

they must first be aware of those services and possess at least a fundamental understanding of how to use them. If they make full use of it, there is a good chance that they will experience the greatest sense of fulfillment possible. At this juncture, the matters of concern are:

- Whether the customers are aware of these services under e-banking or not.
- In the event of their awareness, of whether they are utilising those services or not.
- If they use the services, whether they have service issues or not.
- In case they are using those services, whether they are satisfied with them or not.

In addition, each of the services provides a comprehensive selection of amenities to make the customers' experiences more convenient. If customers are knowledgeable about and make full use of the variety of facilities that are provided to them, then these various services will be able to bring the greatest potential advantages to those customers.

In recent years, the main advancement in technology has brought e-banking services to the banking industry. Technology is changing rapidly, making it difficult for the customer and the bank to determine the best approach. Particular problems arise with trying to integrate new channels with legacy channels. It is for these reasons that academic research is required. In dakshina kannada district where most of the nationalized banks practicing e-banking are facing several problems such as customer preference of the e-banking facility, very poor connection, convenience of clients to utilise and adopt banking facilities. While numerous studies have been undertaken to examine issues in the broader context of the economic and financial implication of e-banking, the comprehensive research in the area of e-banking issues in the specific context of dakshina kannada has been rather limited. In this background, it is appropriate to conduct a study on bank customers and bank employees of dakshina kannada to find out the various factor to challenges and prospects of e-banking. Therefore, the present study strives to provide an understanding of the mind vis-à-vis the accessibility of e-banking at a greater pace than before. This study thus intend to fill the gap in the literature in context of dakshina kannada district. This study attempts to identify prospects and influencing challenges inhibiting acceptance of e-banking in nationalized banks in dakshina kannada. Therefore, the present study is pretty relevant and well-timed from the point of view of both banking and academics.

3. LITERATURE REVIEW

A literature review is an essential component of any research study because it aids in identifying research gaps by examining earlier studies and identifying the variables that need to be scrutinized in the current study. This section summarizes past analysis that has been used to identify the current research challenges and issues relating to the successful application of e-banking activities in a variety of banking industries. Several reports were examined (at both the national and global level) regarding awareness, acceptance and non-adoption of e-banking, issues and challenges, and the prospects of the banking industry in various service sectors to identify study gaps. This helps to understand the theoretical basis and to present the different perspectives offered by different research studies.

Table 1: Number of Articles

Particular	Indian	Foreign	Total
Research Paper Articles	47	57	104
Conference Proceedings Articles	06	03	09
Grand Total	**53**	**60**	**113**

Area of Study	Number of Literature
Global Banking Sector, Information Technology and Digital Banking Studies	**27**
Indian Banking Sector, Information Technology and Digital Banking Studies	**27**

Review on Identified Variables	Number of Literature
Demographic, Bank Profile on the Awareness and Adoption of E-banking	**11**
Awareness and Adoption of E-banking	**06**
Adoption of E-banking and Bank Strategy	**03**
Adoption of E-banking and Customer Satisfaction	**07**
Bank Strategy and Customer Satisfaction	**01**
Issues/Challenges and Customer Satisfaction	**02**
Issues/Challenges and Adoption of E-banking	**03**
Future Development Strategy of Retail E-banking	**02**
Issues/Challenges in the Implementation-Management Perspectives	**02**
Other Related Studies	**22**

Source: Data Compiled by the Researcher

3.1. GLOBAL BANKING SECTOR, INFORMATION TECHNOLOGY AND DIGITAL BANKING STUDIES:

This section critically reviews various studies conducted on a global level with respect to E-banking.

Table 2: Global Banking Sector, Information Technology and Digital Banking Studies

Sl. No.	Region/ Country	Year	Author	Theme	Aim of the Study	Variable and Construct Used	Data Collection and Tools	Participant (Sample Size, Sample Technique)	Findings/Outcomes
1.	Singapore	2003	Rexha, N., Kingshott, R.P.J. & Shang Shang Aw, A.	Adoption of Electronic Banking	The primary goal of this article was to examine if the fundamentals of long-term marketing links had any impact on corporate banking relationships when clients have integrated electronic banking into their existing operations.	Satisfaction, Trust, Use of Electronic Banking, Commitment.	Telephone, Mailing and Personal Delivery of Structured Questionnaire.	Sample Size =157 (14 percent response rate)	It was discovered that trust was the most important element driving the adoption of electronic banking. Customer satisfaction with the bank had just a minor influence on the adoption of electronic banking. The cumulative impacts of customer satisfaction were discovered to have a good influence on trust oriented toward the bank, which had a significant impact on the tendency to utilize electronic banking. Customer happiness, trust, and electronic banking use were shown to have a favorable influence on corporate clients' loyalty to their bank.

2.	U.K	2005	Yousafzai, S. Y., Pallister, J. G., & Foxall, G. R.	Trust in Electronic Banking	By concentrating on the information hints provided on the bank's website, this study explicitly investigates the effectiveness of various trust-building tactics for e-banking and their impact on online consumers' opinions of the bank's trustworthiness.	Trusting Intentions, Perceived Ability, Perceived Integrity, Perceived Benevolence.	Semi-Structured Questionnaire	39 Female and 25 Male respondents belonging to the age of 21-42 years	Customers' views of a company's trustworthiness were influenced by both situational normalcy mechanisms and structural assurance, indicating that banks should employ a variety of trust-building tactics. The findings also imply that consumers' trusting intentions may be influenced by the timely and relevant information that is communicated.
3.	U.S	2010	Yang, J., *et al.*	Comparative study on E-banking Services	To examine the current acceptance and awareness of e-banking among young consumers of two nations and to identify the most influential factors and considerations about the future development of e-banking from the perspective of customers.	Awareness, Usage, and Satisfaction	Semi-Structured Questionnaire. Correlation Analysis	Sample Size=135(Male 74; female 61) Sample Unit= College campuses in both China and USA Country. Simple random Sampling Technique.	The study concluded that there is a substantial difference in knowledge and use of e-banking facilities between the two countries. Less available facilities and poor service efficiency are two crucial problems faced by Chinese banks as a result of the country's low competitive banking market and lack of a national credit scheme. They also noted that, due to the differences in cultures and customs, Chinese customers are more comfortable and receptive to new service availability (both in e-banking and Mobile Banking), while US customers are less

									conscious and conservative. Finally, they concluded that, in order to progress to a higher level, banks in China would focus on a number of new tasks.
4.	Foreign	2015	Akhisar, I., Tunay, K. B., & Tunay, N.	Bank Performance	This study looked into how the bank's success on electronic-based banking services affected its profitability.	Innovation, Electronic Banking, Profitability	ROA and ROE	Data from 23 developed and developing countries' electronic banking services through 2005 to 2013.	The results reveal that the ratio of the number of branches to the number of ATMs has a substantial impact on bank profitability in both developed and developing nations, as well as electronic banking services. Because of differences in the nations' levels of development, socio-cultural structure, and electronic banking infrastructure, several factors were discovered to be in contradiction to the projected negative association.
5.	Ukraine	2020	Melnychenko, S., Volosovych, S., & Baraniuk, Y.	Financial Technologies in Digital Banking	The objective of the research is to define the key concepts underlying financial technology used in digital banking.	Artificial Intelligence, Biometrics, Cloud Services, Big Data, Blockchain and Open Banking Services	Theoretical Generalization, Qualitative, Quantitative and Correlation Analysis, Causality Tests, Description	-	The study's findings supports the effect of AI, biometrics, cloud computing, big data, blockchain, and open financial services on digital banking. Financial technology allows for the generation and storage of large amounts of data, simultaneous analysis and application of the results of that analysis, the provision of

							and Explanation		personalized banking services, the performance of functions involving the central storage of client information of both a financial and non-financial nature, which facilitates the efficient decision-making of investments and credit, as well as the improvement of the level of information security of banking operations.
6.	Ethiopia	2023	Ayinaddis, S.G., Taye, B.A. & Yirsaw, B.G.	Customer Satisfaction on Technological Innovation	To investigate the impact of the quality of electronic banking (e-Banking) services on customer satisfaction in Ethiopia's developing banking sector.	Responsivenes, Reliability, Security and Privacy, Speed, and Convenience	Questionnaire Survey Standard Deviations, Chi-Square Correlations, and Multinomial Logistic Regression	385 respondents Convenience Sampling Technique used	According to the findings of the study, customer satisfaction with the quality of electronic banking services has a significant impact on customer loyalty. In comparison, system availability, ease of use, and service fees have no statistically significant effect on customer satisfaction. As a study's results, it is advised that banks prioritise elements such as responsiveness, dependability, system availability, and speed in order to maximise customer satisfaction and loyalty.

3.2. INDIAN BANKING SECTOR, INFORMATION TECHNOLOGY AND DIGITAL BANKING STUDIES:

This section critically reviews various studies conducted in India with respect to e-banking, information technology and digital banking studies.

Table 3: Indian Banking Sector, Information Technology and Digital Banking Studies

Sl. No.	Region/ Country	Year	Author	Theme	Aim of the Study	Variable and Construct Used	Data Collection and Tools	Participant (Sample Size, Sample Technique)	Findings/Outcomes
7.	India	2010	Pathania, K. S., & Sharma, M.	Banking Technology	To examine the adoption rate of banking technologies (i.e., ATM, Internet Banking, Phone Banking and Mobile Banking) and identify the awareness level, satisfaction and operational problem related to the use of modern technologies by customers.	ATM, Internet Banking, Phone Banking, Mobile Commerce	Semi-Structured Questionnaire and Survey Simple Percentage and Chi-Square Test	Sample Size=100 Public and Private Bank Operated in Shimla and Solan District of Himachal Pradesh State Multistage Sampling	The study revealed that, customer have a more aware on ATM channel and least awareness on Mobile banking. However, ATM channels is used more extensively among all the other channel followed by them.
8.	India	2015	Dhananjay, B., & Ch, S.	Retail Electronic Payment System	Objective to assess the contribution of NPCI (National Payments Corporation)	E-Banking Revolution	Secondary Data Using t-Test	Data was taken from 2006-07, 2007-08, 2008-09, 2009-10 and after years include 2010-11, 2011-12, 2012-13, 2013-14.	They discovered a substantial difference for paper clearing, retail electronic clearing, ECS (Debit), NEFT, Card, Credit Cards, and Debit Cards at POS, but not for ECS (Credit). Following the foundation of NPCI, several additional products were added, including Immediate Payment Services (IMPS),

									Prepaid Instruments (PPI), and National Automated Clearing House (NACH). This is why we couldn't compare the products available after the founding of NPCI, such as IMPS, NACH, Prepaid, and CTS.
9.	India	2019	Revathi, P.	Challenges and Opportunity	The purpose of the study is to analyze the challenges and opportunities of digital banking.	Traditional Banking Habits, Security, Technical Issues, Transaction Difficulties, and Small Marketing Budgets.	Survey	Sample Size of 192 Banks	As per findings more clients are adapting to mobile platforms, and younger people are utilizing internet platforms. Because of these factors, there is undeniable power that can be utilized through digital platforms. However, in order to harness the potential of digitalization, a number of obstacles must be addressed.
10.	India	2022	Syed AA, Kamal MA, Ullah A., Grima S.	Indian Digital Banking Service	To access the impact of an asymmetric analysis of the influence that economic policy uncertainty, institutional quality, and corruption level have on India's digital banking services and banking stability	EPU; Corruption; Institutional Regulation; Npls; Digital Growth	(Z-Score)	-	As per the findings policy uncertainty, corruption, and institutional regulation all impede Indian banking stability and digital growth. The study provides numerous policy implications in order to comprehend the negative consequences of economic policy uncertainty on the Indian banking industry.

3.3. REVIEW ON IDENTIFIED VARIABLES:

This section reviews various articles pertaining to identified variables explaining the relationship between them consisting of i) Demographic, Bank Profile on the Awareness and Adoption of E-banking, ii) Awareness and Adoption of E-banking, iii) Adoption of E-Banking and Customer Satisfaction, iv) Bank Strategy and Customer Satisfaction, v) Issues/Challenges and Customer Satisfaction, vi) Issues/Challenges and Adoption of E-Banking, vii) Future Development Strategy of Retail E-banking and viii) Issues/Challenges in the Implementation -Management Perspectives.

4. RESEARCH GAP

Despite the availability of e-banking services offered by major banks and the growing number of internet users, the slow pace of e-banking adoption remains a concern for bankers. This reluctance towards e-banking adoption can be attributed to various factors, including perception, resource availability, knowledge, and trust. Ramudu, J., & Rao, D. (2006) pointed out that Indian banks still have a long way to go in terms of internet banking services. Several authors, such as Roshan *et al.* (2012), Ratna (2014), & Chauhan *et al.* (2015), have observed an increase in the popularity of e-banking in India. However, its adoption is still in its early stages. Over the past few years, a highly competitive e-banking sector has emerged, as highlighted by the International Data Corporation (IDC) (Sharma D., 2016).

The financial insights reflect a rise in the usage of e-banking across Asia-pacific and India is one among them (Australia, China, Hong Kong, India, Korea, Malaysia, Singapore, Taiwan and Thailand). According to the latest IDC report, the transaction cost is almost one-eighth of that done through branch banking. The challenge before the banks will be to educate the customers for internet banking use, increase the internet banking user base and improve the variety of customer services (Sharma D., 2016).

- In this background, it is appropriate to conduct a study on bank customers and bank employees of Dakshina Kannada district to find out the various factor to challenges and prospects of e-banking. It is essential for internet banking. Therefore, the present study strives to provide an understanding of the mind vis-à-vis the accessibility of e-banking at a greater pace than before. Thus, this study intends to fill the literature gap in the context of Dakshina Kannada. Therefore, the present

study is pretty relevant and well-timed from the point of view of both banking and academics.

- As per the exhaustive literature survey, various studies are conducted on prospects and challenges the customers face, which only focuses on the existing challenges and prospects but does not take customers' opinions for future development. This study attempts to bridge this gap by collecting customers' opinion on future development required in e-banking.
- Furthermore, no studies address whether customer satisfaction or challenges influences their recommendation with respect to future development and strategies in e-banking.
- Importantly, this study is unique in its own nature as it will address how awareness may affect their adoption level which may enhance their satisfaction through various strategies. Again this adoption and satisfaction may be affected due to various challenges which require further improvement in e-banking. Therefore, the present research proposes a new conceptual model to extend a knowledgeable contribution to the existing body of literature.

5. RESEARCH QUESTIONS

The research is undertaken to study e-banking services provided by selected nationalized banks in the dakshina kannada district. The researcher tries to find out answers to the following research questions.

RQ1: Does the demographic and bank profile of the customers determines their awareness, adoption/utilization, satisfaction level on e-banking?

RQ2: Whether issues and challenges faced by the customers due to demonetization, COVID-19, and merger are significantly different among their bank profiles?

RQ3: Do highly aware customers utilize e-banking services to the greatest extent?

RQ4: Whether customer satisfaction on e-banking is due to high utilisation level?

RQ5: What is the role of banking strategies in the adoption of e-banking?

RQ6: Does level of challenges faced by the customers affects their e-banking adoption and satisfaction level?

RQ7: Whether challenges and satisfaction experienced by the customers motivate them to recommend a development strategy for e-banking?

RQ8: Does promotional activities adopted by the banks have any impact on banks' performance?

RQ9: Whether Issues, challenges and banks scam diminishes banks' performance and increases work load?

RQ10: Whether banks' performance is affected by the challenges and whether banks' performance contributes to employee satisfaction?

6. OBJECTIVES OF THE STUDY

The following are the broad view objective outlined for the purpose of study as follows:

From the view of **Customer Perspective**:

- To know the influence of demographic and bank profile of the customers on their awareness, adoption/utilization, and satisfaction level on e-banking.
- To assess the role of e-banking awareness in the adoption of e-banking.
- To analyse the impact of e-banking utilization on customer satisfaction.
- To examine the influence of banking strategy in improving customer satisfaction.
- To identify the issues and challenges faced by the users of e-banking services and their impact on their e-banking adoption and satisfaction.
- To identify the most important variables and aspects that customers recommend to develop in the future.

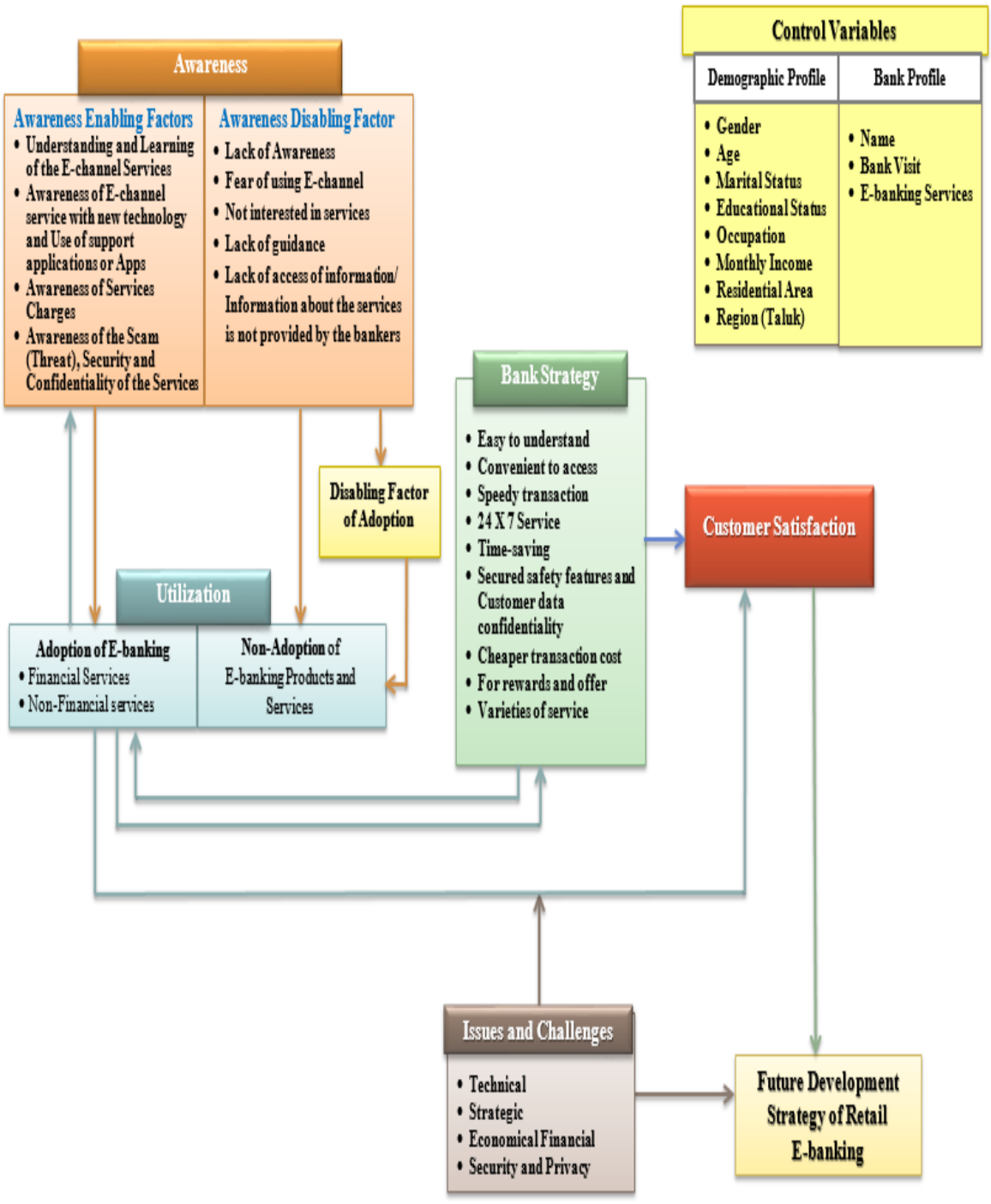
From the view of **Banker's Perspective**:

- To identify the e-banking services provided by the nationalized banks and to know the impact of e-banking services offered by the bankers to the customers.
- To investigate the impact of issues and challenges of e-banking on bank performance and employees workload.
- To assess the influence of bank performance on employee satisfaction.
- To measure the negative impact of challenges on employees satisfaction.
- To give suggestion to the nationalized banks for the future prospects of e-banking services.

7. CONCEPTUAL MODEL

The purpose of developing a research model was to direct data collecting and provide a proper conceptual framework for exploring and studying the elements that drive bank customers to adopt e-banking Services. Based on the theories and models, the researcher has formulated a research model demonstrated in figure 1.

Figure 1: Conceptual Model


Control Variables
Demographic Profile
Bank Profile
• Gender
• Age
• Marital Status
• Educational Status
• Occupation
• Monthly Income
• Residential Area
• Region (Taluk)
• Name
• Bank Visit
• E-banking Services
Awareness
Awareness Enabling Factors
• Understanding and Learning of the E-channel Services
• Awareness of E-channel service with new technology and Use of support applications or Apps
• Awareness of Services Charges
• Awareness of the Scam (Threat), Security and Confidentiality of the Services
Awareness Disabling Factor
• Lack of Awareness
• Fear of using E-channel
• Not interested in services
• Lack of guidance
• Lack of access of information/ Information about the services is not provided by the bankers
Bank Strategy
• Easy to understand
• Convenient to access
• Speedy transaction
• 24 X 7 Service
• Time-saving
• Secured safety features and Customer data confidentiality
• Cheaper transaction cost
• For rewards and offer
• Varieties of service
Disabling Factor of Adoption
Customer Satisfaction
Utilization
Adoption of E-banking
• Financial Services
• Non-Financial services
Non-Adoption of E-banking Products and Services
Issues and Challenges
• Technical
• Strategic
• Economical Financial
• Security and Privacy
Future Development Strategy of Retail E-banking

Source: Developed by the Researcher

8. HYPOTHESES

An analytic look at the research studies clearly exposed important gaps in literature on e-banking. Even though very few studies have been conducted on challenges and prospects of e-banking in several countries and even in India, the available of literature is still scanty in Dakshina Kannada district. The following hypotheses have been formulated and tested in accordance with the research objectives:

H1: Demographic and bank profiles of the customers significantly determine their awareness, adoption/utilization, satisfaction level on e-banking.

H2: Issues and challenges faced by the customers due to demonetization, COVID-19, merger significantly differ among their bank profiles.

H3: Issues and challenges in using e-banking services are associated with the banking profile of customers.

H4: Highly aware customers utilise e-banking services to the greatest extent.

H5: Customer satisfaction on e-banking is significantly influenced by their utilisation level.

H6: Banking strategies significantly determines the adoption level of e-banking

H7: Adoption of e-banking services highly contributes to customer satisfaction when it is mediated by banking strategies.

H8: The impact of e-banking adoption on customer satisfaction is high when they face low level of issues and challenges.

H9: Customer satisfaction and challenges significantly influences the future development strategy for retail e-banking.

H10: Bank employees' satisfaction and challenges with respect to e-banking is significantly influenced by their demographic profile.

H11: Bank performance is the result of promotional activities and medias used by the banks.

H12: Issues, challenges and banks scam diminishes bank performance and increases work load

H13: Employees' satisfaction with e-banking is significantly determined by their bank performance and work load.

H14: The level of challenges can significantly alter the impact of bank performance and employees' workload on their satisfaction.

9. SIGNIFICANCE AND JUSTIFICATION OF RESEARCH STUDY

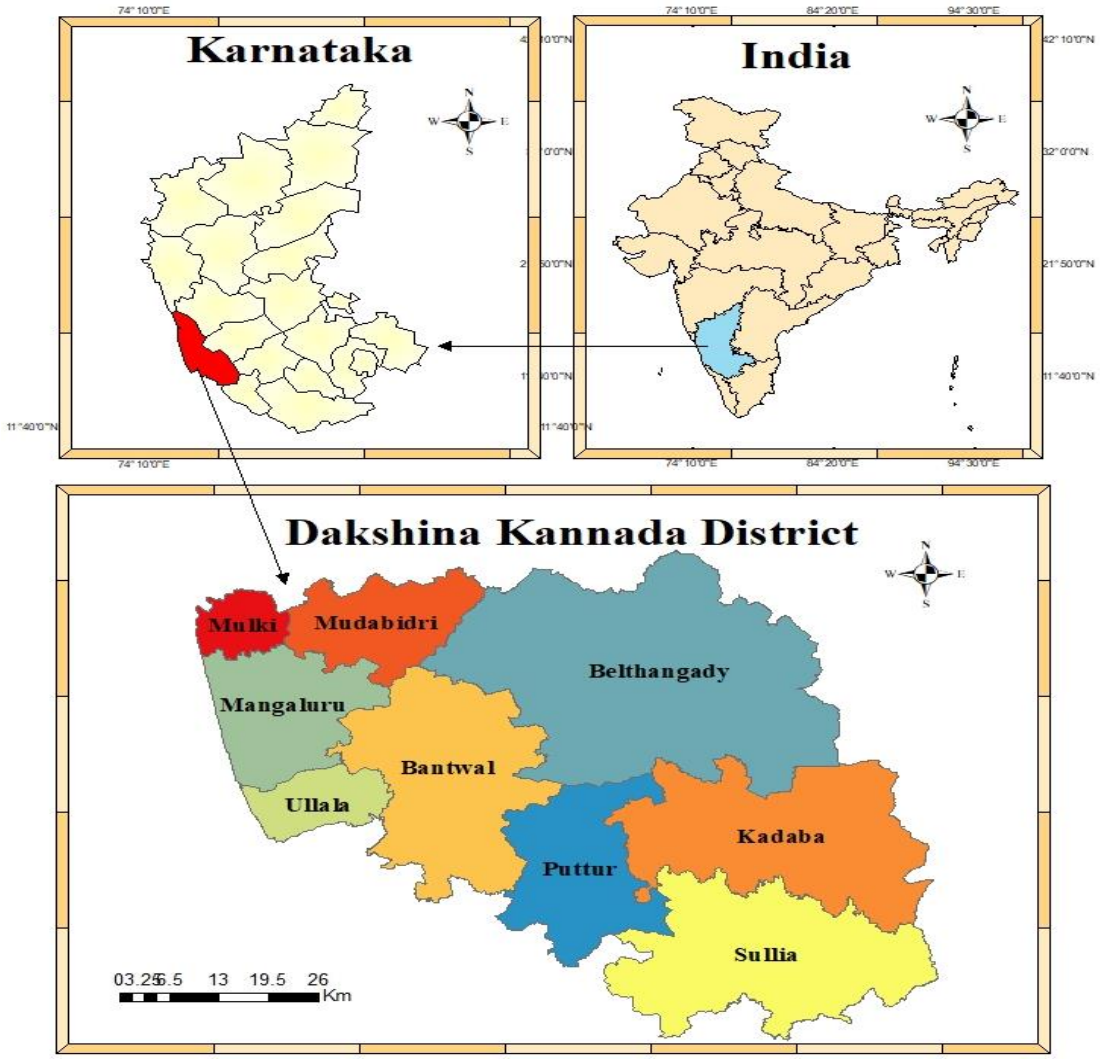
Advancement in Information Technology (IT) has swiftly transformed the mode of designing and providing personal financial services in India. The financial industry has seen tremendous upheaval during the past ten years due to shifting consumer behavior, the development of new technology, and the introduction of new goods and services to the market (Baptista & Oliveira, 2016; Malaquias & Hwang, 2016). Customers benefit from more convenience and accessibility through electronic banking, while financial operations costs are reduced (Hoehle, Scornavacca, & Huff, 2012; Montazemi & Qahri-Saremi, 2015). As a result of this transition, customers have begun to use e-banking for routine financial transactions and account functions. Despite these benefits, adoption rates in developing nations vary substantially (Takieddine & Sun, 2015). The distinct cultural values found in different countries may lead to varying acceptance rates (Warkentin, Charles-Pauvers, & Chau, 2015; Zhao, Shen, & Collier, 2014). E-banking allows customers to perform various banking transactions electronically via the bank's website anytime and anywhere. In addition, customers are no longer confined to the opening hours of banks; travel and waiting times are no longer necessary and access to information regarding banking services is easily available. Security is an important issue for e-banking as customers have fear about their secrete financial and transactional data. However, new techniques and methods are being adopted to provide security and privacy.

Although, banks have made revolutionary efforts to provide more effective and easy internet banking or e-banking facility, still this facility is not noticed by most of the customers. Thus, there is a requirement of the identification of various factors affecting the intention of e-banking. Such an issue is of high importance because the result of the study on such issue provides key success factors in formulating strategies to promote e-banking. The study will help enlighten the banking sector and other concerned individuals and bankers for using electronic banking. This research will highlight the fact that e-banking has helped increase efficiency in the daily banking process. This research will help banks face competitive environments by understanding needed information regarding usage and different problems encountered by service users while availing e-banking services like the operation of ATMs, NEFT, RTGS, Fund Transfer and other e-channels, and arriving at appropriate solutions to improve their performance. The research will investigate to identify the technical challenges,

operational challenges and future of e-banking in dakshina kannada district and suggestions that could be undertaken. The proposed study will give a broad understanding of the challenges and prospects of e-banking related to nationalized banks in dakshina kannada district.

10. SCOPE OF THE STUDY

This study is mainly focused on the Dakshina Kannada District. The Dakshina Kannada district, one of the three coastal districts the state possesses, is situated in the western belt and has a total size of 4861 square kilometers. The district's largest areas are 80 km north and south and 96 km east and west. The district's most noticeable extremely high and very low locations are situated at 10 and 1,050 meters above mean sea level, respectively (MSL).



Source: Author's own creation from the revenue map of Karnataka State, 2022.

Figure 2: Geographical Map of Dakshina Kannada District

Table 4: District at Glance

Area	4,866 sq km
Population	20,89,649
Literacy Rate	88.57%
Assembly Constituencies	8
Taluks	9
Revenue Villages	422
Village Panchayths	223
City Corporations	1
City/Town Municipalities	5
Town Panchayaths	8

Source: Dakshina Kannada District website as on 31.12.2022 (https://dk.nic.in/en/)

The major scope of this study is to research awareness and utilisation of various electronic banking services in banks and to perform an empirical study on the problems of e-banking in nationalized banks. The planned study would concentrate on a few nationalized banks in the Dakshina Kannada district and survey of bank Staff from the information technology (IT) department, other department workers in the banks such as officers, clerical, and customers who utilise the retail e-banking services are included in the study. The research focuses on the challenges and prospects of using retail e-banking services in the Dakshina Kannada district. As a result, the following topics will be covered in this research:

10.1 Area and Nature of Banks:

South canara is called the cradle of banking in India. This is because the country's leading banks are Canara Bank, e-Syndicate Bank, e-Corporation Bank, and e-Vijaya Bank. Four Major Nationalized banks (Public Sector) in Dakshina Kannada District (SLBCK, 2022). The study focuses on seven taluks viz., Bantwal, Belthangady, Kadaba, Mangaluru, Moodabidri, Puttur, and Sullia are among the taluks and population-wise (Rural, Semi-Urban and Urban) has taken into account in the Dakshina Kannada District of Karnataka state in India. The Four nationalized banks were chosen by the researcher for the study, those banks are Bank of Baroda, Canara Bank, State Bank of India, and Union Bank of India are all Public Sector Banks. The selected nationalized banks criteria are as follows;

Table 5: Consideration of Selected Nationalized Banks for Research Study

Name of Nationalized Banks	Criteria
Bank of Baroda (Dena and Vijay Bank)	• C/D Ratio is 75 percent in Karnataka as on march 2016, Vijay Bank merged with Bank of Baroda as on 1st April 2019.
Canara Bank (Syndicate Bank)	• Lead Bank of Dakshina Kannada District, Syndicate Bank merged with Canara bank as on 1st April 2020, C/D Ratio is 64 percent in Karnataka as on March 2016.
State Bank of India (SBI)	• Largest Public Sector Bank in India, C/D Ratio is 74 percent in Karnataka as on March 2016.
Union bank of India (Andhra bank and Corporation Bank)	• The first large public sector bank in the country to have implemented 100 percent core banking solution, C/D Ratio is 73 percent in Karnataka as on March 2016, Corporation Bank and Andhra Bank merged with Union Bank of India as on 1st April 2020.

Note: C/D Ratio: Credit and Deposit Ratio.

Source: Data compiled from SLBC, Karnataka, as on 31.03.2016 to 31.03.2021 and Annual report of RBI -2020 as on 31.03.2021.

10.2. Banking Services:

The research focuses on retail e-banking services offered by selected nationalized banks in the Dakshina Kannada district. This is because the adoption of e-banking is required for the survival and expansion of the banking sector. Customers are increasingly migrating from "Traditional Banking to E-banking Systems". Among the numerous e-banking services, the study focuses on consumers' awareness, utilisation, problems, challenges, and satisfaction with ATMs, Debit Cards, Credit Cards, Net Banking, and Mobile/SMS Banking. This study was limited to the viewpoints of Nationalized Banks (Public Sector) and did not include Private Sector Banks. Nationalized (Public Sector) banks are distinguished by the government's ownership of a majority stake (more than 50 percent of the shares) and control over their operations.

10.3. Time Period:

The study's time frame is confined to the years 2016 to 2023. As a result, the scope of the study is limited during these period.

11. RESEARCH METHODOLOGY

The methodology applied by the researcher in conducting the proposed research work. It provides details about the research design used for the study, the nature and source of data collected for the study and details about the research instrument used for the research. Further, it provides a brief description of the variables used for the study and provides details about the various tests. Since, the study is an analytical study of e-banking services provided by nationalized in dakshina kannada district the researcher has randomly selected Four nationalized banks among the banks. E-banking service users of nationalized banks in dakshina kannada district constitute the universe.

11.1. TYPES OF DATA:

In the research study, both primary and secondary data are used. The primary data is collected in order to fulfil the information requirements of certain objectives. Thus, primary data is collected to describe the current scenario of e-banking services provided by selected nationalized banks and identify the challenges and problems faced by e-banking service users and bankers. The secondary data is collected to fulfill the information requirements of few objectives. The researcher has opted for the survey. Which is of two types-A literature survey (Secondary Data) and a field survey (Primary Data). Both the surveys are equally important since sometimes they fulfill the role of dependence complementary in nature and supplements in nature. The data is collected from the following sources:

11.2. LITERATURE SURVEY (SECONDARY DATA):

Literature survey or secondary data analysis, is a critical examination and synthesis of existing research and publications on a specific topic. It involves gathering information from various sources, such as:

- Reference Books
- Research Articles
- Ph.D. Thesis
- Websites
- Newspapers
- Banks related reports and data were collected from the Regional Office of the State Bank of India, Bank of Baroda, Canara Bank, and Union Bank of India at Dakshina Kannada District.

11.3. FIELD SURVEY (PRIMARY DATA):

The data for this study was collected from the field survey of nationalized banks (retail) customers and banks employees residing in Dakshina Kannada (Taluk of Bantwal, Belthangady, Kadaba, Mangaluru, Moodabidri, Puttur, and Sullia) and bank customers from different fields, residential areas, market and malls, bank premises and so on. A "Proportionate Stratified Random Sampling" technique was used for the study. The survey technique was used as a research instrument to collect information and primary data from bank customers and banks' employees. A structured questionnaire was designed and developed as a survey tool to gather information from respondents for achieving the research objectives.

11.4. TOOLS FOR COLLECTING DATA:

The method to collect data in this case was personal interview method. The researcher used a structured questionnaire. The structuring refers to question numbers and wordings being adherently followed in sequence. All the respondents were told about the objectives of the questions and why the such study was undertaken. The study used a structured questionnaire because the data to be captured was more behavioural and less of an attitudinal type. A pilot survey method was used to understand the relevance of the questions and validate the sections. Finally, this questionnaire had seven parts, besides a personal data section at the top. The following are the parts and their details with several questions:

(a) Questionnaire for E-banking service users have been divided into Eight parts as follows:

PART I: Demographical Profile

PART II: Banking Information

PART III: ATM Services

PART IV: Debit Card Services

PART V: Credit Card Services

PART VI: Net Banking

PART VII: Mobile/SMS Banking

PART VIII: Open Ended Questions

(b) Questionnaire for Bankers' have been divided into six parts as follows:

PART I: Demographical Profile

PART II: Present Status of E-banking

PART III: Issues and Challenges of the E-banking

PART IV: Satisfaction on E-banking

PART V: Open Ended Questions

11.5. CONSTRUCTION OF RESEARCH TOOL:

The language and order of the questions, the selection and wording of the response categories, the format and manner of giving the questionnaire, as well as the introduction and justification of the survey are all considerations that must be considered while constructing a questionnaire. Even while designing a questionnaire is still mostly an art, more data is becoming available to help with these decisions (Martin, 2006). As a result, by taking into account several papers relating to e-banking, various components have been found to build a research tool. Items under each component were taken from a multitude of articles, as seen in Table 6.

Table 6: Sources of Research Tools (Questionnaire 1)

Sl. No.	Variables	Source
1	Awareness on E-banking	Ananda, S., Devesh, S., & Al Lawati, A. M. (2020); Adholiya, A., & Adholiya, S. (2019); Sohail, M. S., & Shanmugham, B. (2003); Baten, M. A., & Kamil, A. A. (2010); Singhal, S. (2017); Chaudhari, A., Patil, M., & Sonawane, M. (2014).
2	Utilization of E-banking	Toufaily, E., Daghfous, N., & Toffoli, R. (2009); Carranza, R., Díaz, E., Sánchez-Camacho, C., & Martín-Consuegra, D. (2021); Parameswar, N., Dhir, S., & Dhir, S. (2017); Jouzdani, J., Shirouyehzad, H., Maaroufi, N., & Javaheri, A. (2020).
3	Influential Banking Strategy in the Adoption of E-banking	Poon, W. C. (2008); Barbara R, Lewis (1991); Yap B. Kenneth, *et al.,* (2010); Maymand & Fard (2015); Kajuju (2016); Maymand & Fard (2015).
4	**Issues/Challenges**	
4.1	Technical Factors	Yibin (2003); AlAbdullah *et al., (*2010)

4.2	Operating and Knowledge Factor	Khalfan & Alshawaf (2004); Applegate *et al*., (2006); Rahman, M (2022); Shah & Clarke (2009); Gardner (2011).
4.3	Strategic Factor	Shah *et al*., (2012); Johnson, M., & Moore (2007); Nigudge & Pathan, (2014); Zewdu, (2019); Hailu (2019).
4.4	Economic Financial Factor	Khalfan & Alshawaf (2004); Nigudge & Pathan (2014); Yang, (2009); Campbell, D., & Frei (2010).
4.5	Security and Privacy Factor	Kalakota, Robinson (1999); Whyte (2001); Khalfan & Alshawaf (2004); Tom Glaessner *et al*, (2003).
5	Customer Satisfaction	Isibor, A. A., Omankhanlen, A. E., Okoye, L. U., Achugamonu, B. U., Adebayo, M. E., Afolabi, G. T., & Ayodeji, O. E. (2018); Sardana, S., & Bajpai, V. N. (2020); Devi, P. A., & Malarvizhi, V. (2010); Rahi, S., Ghani, M. A., & Ngah, A. H. (2020); Hamidi, H., & Safareeyeh, M. (2019); Ramesh, V., Jaunky, V. C., Roopchund, R., & Oodit, H. S. (2020)
6	Development Strategies and Future Direction	Ahmad, I., Iqbal, S., Jamil, S., & Kamran, M. (2021); Ansari, S. J., & Khan, N. A. (2017); Krishnakumar & Selvam (2011).

Source: Data Compiled

Table 7: Sources of Research Tools (Questionnaire 2)

Sl. No.	Variables	Source
1.	Bank Operation through E-banking	Nitsure, R. R. (2003); Drigă, I., & Isac, C. (2014); Chaimaa, B., Najib, E., & Rachid, H. (2021); Nduta, R. W., & Wanjira, J. (2019).
2.	E-banking on Banks Performance	Fliginskih, T. N., Vaganova, O. V., Solovjeva, N. E., Bykanova, N. I., Ragheed, Y., & Usatova, L. V. (2020); Arshad Khan, M., & Alhumoudi, H. A. (2022); Lasmini, R. S., Budiarti, A. P., Tasman, A., & Susant, F. A. (2020); Evian, M., Limijaya, A., & Hutagaol-Martowidjojo, Y. (2021).
3.	E-banking on Employees' Daily Activities and Workload	Khattab, I., Mohmed Ahmed, A., & Al-Magli, O. O. (2019); Camara, A., Rahim, M. Z. B. A., Yusof, Y. B., Tambi, A. M. B. A., & Magassouba, S. M. (2019).

4.	E-banking Channels	Nazaritehrani, A., & Mashali, B. (2020); Inegbedion, H., Inegbedion, E. E., Osifo, S. J., Eze, S. C., Ayeni, A., & Akintimehin, O. (2020); Cui, X., & Xu, J. (2022); Saxena, N., Gera, N., Nagdev, K., & Fatta, D. D. (2021); Khattab, I., Ahmed, A. M., & Al-Magli, O. A. O. (2020); Nagar, N., & Ghai, E. (2019).
5.	Promotional Activity about the E-banking service	Alsmadi, A. A., Shaban, M., & Al-Ibbini, O. A. (2019); Mansyur, M. (2021); Shafei, R., & Sijanivandi, S. (2022).
6.	Issues and Challenges of the E-banking	Vishnuvardhan, B., Manjula, B., & Lakshman Naik, R. (2020); Messabia, N., Doheir, M., Mahmoud, A., Bin Hasan Basari, A. S., Abu Selmiya, N., & Sayed, A. A. (2019); Ali, M., Kalwar, M. A., & Khan, M. A. (2021); Adholiya, A., & Adholiya, S. (2019); Obeng-Ayisi, E., Quansah, C., Mensah, R. O., & Acquah, A. (2022); Kato, C. I. (2019).
7.	Employee Satisfaction towards E-banking	Lymperopoulos, C., & Chaniotakis, I. E. (2004); Pambudi, A., Widayanti, R., & Edastama, P. (2021); Gupta, S., & Yadav, A. (2017); Jegan, P., & Gnanadhas, M. D. (2011).

Source: Data Compiled

11.6. SAMPLING DESIGN:

11.6.1. Sampling Unit:

The sampling unit is considered as the bank employees and bank customer of e-banking users of selected nationalized banks from dakshina kannada district. The sample units considered in the seven taluk are Bantwal, Belthangady, Kadaba, Mangaluru, Moodabidri, Puttur, and Sullia are economically developed and population-wise considered under the rural, semi-urban and urban area in dakshina kannada district.

11.6.2. Population of the Study:

For the purpose of research, a universal sample of bank branches, bank customers, and bank employees of nationalized banks (Public Sector Banks) in dakshina kannada district is considered as follows:

Table 8: Category-wise Population of the Banks' Branches

Bank	Region/ Taluk	Bantwal	Belthangady	Kadaba	Mangaluru	Moodabidri	Puttur	Sullia	Total No. of Bank Branches	Percent of particular bank branches in total bank branches
Bank of Baroda (e-Vijay Bank and e-Dena Bank)	Rural	08	06	05	11	01	07	06	**44**	**21.95**
	Semi-Urban	05	01	-	06	01	02	01	**16**	
	Urban	-	-	-	21	-	-	-	**21**	
	Total	**13**	**07**	**05**	**38**	**02**	**09**	**07**	**81**	
Canara Bank (Syndicate Bank)	Rural	11	16	06	17	03	07	06	**66**	**42.82**
	Semi-Urban	09	02	-	08	04	04	04	**31**	
	Urban	-	-	-	61	-	-	-	**61**	
	Total	**20**	**18**	**06**	**86**	**07**	**11**	**10**	**158**	
State Bank of India (All Associates of SBI)	Rural	01	04	03	07	-	02	01	**18**	**16.53**
	Semi-Urban	04	01	-	05	03	02	01	**16**	
	Urban	-	-	-	27	-	-	-	**27**	
	Total	**05**	**05**	**03**	**39**	**03**	**04**	**02**	**61**	
Union Bank of India (e-Andhra and e-Corporation Bank)	Rural	05	03	02	04	06	03	01	**24**	**18.70**
	Semi-Urban	02	01	-	12	01	02	01	**19**	
	Urban	-	-	-	26	-	-	-	**26**	
	Total	**07**	**04**	**02**	**42**	**07**	**05**	**02**	**69**	
Overall Total		**45**	**34**	**16**	**205**	**19**	**29**	**21**	**369**	**100.00**

Source: 1. State Level Bankers Committee, Karnataka, as on 31.03.2021.

2. Regional office of BOB, Canara Bank, SBI, and UBI in Dakshina Kannada as on 31.03.2021. It is updated based on information received from Banks.

Table 9: Population of Saving Bank Account Holders of Nationalized Banks (Branches) in Dakshina Kannada District

Bank	Bank of Baroda		Canara Bank		State Bank of India		Union Bank of India		Grand Total	
Taluk	No. of Branch	Population	No. of Branch	Population	No. of Branch	Population	No. of Branch	Population	No. of Branch	Population
Bantwal	**13**	31802	**20**	48930	**05**	13430	**07**	18569	**45**	112731
Belthangady	**07**	17124	**18**	44037	**05**	10445	**04**	9786	**34**	81392
Kadaba	**05**	12231	**06**	14679	**03**	7339	**02**	4893	**16**	39142
Mangaluru	**38**	92958	**86**	210399	**39**	95991	**42**	102754	**205**	502102
Moodabidri	**02**	4893	**07**	17126	**03**	7339	**07**	15193	**19**	44551
Puttur	**09**	22017	**11**	26912	**04**	9785	**05**	12722	**29**	71436
Sullia	**07**	17124	**10**	24465	**02**	4892	**02**	4893	**21**	51374
Total	**81**	**198149**	**158**	**386819**	**61**	**149221**	**69**	**168810**	**369**	**902728**

Source: The Regional Office of BOB, Canara Bank, SBI, and UBI in Dakshina Kannada as of 31.03.2021 and 31.09.2021. It is updated based on information received from Banks and websites.

Table 10: Population of Banks' Employees of the Nationalized Banks (Branches) in Dakshina Kannada District

Bank Name	Region	Officer	Clerical	Sub-Staff	Total	Percentage of employees of a particular bank out of total employees of all banks
Bank of Baroda	Rural	102	90	36	**228**	**23.82**
	Semi-Urban	56	50	19	**125**	
	Urban	217	70	31	**318**	
	Total	**375**	**210**	**86**	**671**	
Canara Bank	Rural	167	121	75	**363**	**37.45**
	Semi-Urban	91	52	37	**180**	
	Urban	246	161	105	**512**	
	Total	**504**	**334**	**217**	**1055**	
State Bank of India	Rural	27	39	11	**77**	**15.83**
	Semi-Urban	47	73	20	**140**	
	Urban	64	136	29	**229**	
	Total	**138**	**248**	**60**	**446**	
Union Bank of India	Urban	185	89	55	**329**	**22.90**
	Semi-Urban	62	78	30	**170**	
	Rural	49	64	33	**146**	
	Total	**296**	**231**	**118**	**645**	
Grand Total		**1313**	**1023**	**481**	**2817**	**100.00**

Source: The Regional Office of BOB, Canara Bank, SBI and UBI in Dakshina Kannada as of 31.03.2021 and 31.09.2021. It is updated based on information as received from Banks and websites.

11.6.3. Sampling Method and Sample Size of Retail Banks' Customers:

(i) For Retail Banks' Customers:

According to Yamane's (1967) formula for calculating sample size:

$$n = \frac{N}{1 + N\,(e)^2}$$

Where,

n = Sample Size

N = Population Size

e = Level of Precision

In which N = with ± 5 percent precision, Assuming 95 percent confidence level and e = 0.05

$$n = \frac{\mathbf{902728}}{1 + \mathbf{902728} * (0.05)^2}$$

n = **399.82** (Round off)

Therefore, the approximate sample size of retail banks customers is **400.**

(ii) Sample Size of Retail Banks' Customers:

To determine the bank-wise e-banking service users, the population ratio was considered. The sample of the population is divided into 'Strata' on the basis of the Taluk. The bank-wise sample size of e-banking service users is taken as per the Bank-wise ratio of the banks' population. Hence the study used proportionate stratified sampling. Further detail on this sampling is described as follows:

Table 11: Sample Size of Retail Banks' Customers

Bank Name	Taluk	Bank Branches	Population	Ratio	Sample Size
Bank of Baroda	Bantwal	**13**	31802	3.52	14
	Belthangady	**07**	17124	1.90	08
	Kadaba	**05**	12231	1.36	05
	Mangluru	**38**	92958	10.3	41
	Moodabidri	**02**	4893	0.54	02
	Puttur	**09**	22017	2.44	10
	Sullia	**07**	17124	1.90	08
		81			**88**
Canara Bank	Bantwal	**20**	48930	5.42	22
	Belthangady	**18**	44037	4.88	20
	Kadaba	**06**	14679	1.63	07
	Mangluru	**86**	210399	23.31	93
	Moodabidri	**07**	17126	1.90	08
	Puttur	**11**	26912	2.98	12
	Sullia	**10**	24465	2.71	11
		158			**173**
State Bank of India	Bantwal	**05**	13430	1.49	06
	Belthangady	**05**	10445	1.16	05
	Kadaba	**03**	7339	0.81	03
	Mangluru	**39**	95991	10.63	42
	Moodabidri	**03**	7339	0.81	03
	Puttur	**04**	9785	1.08	04
	Sullia	**02**	4892	0.54	02
		61			**65**
Union Bank of India	Bantwal	**07**	18569	2.06	08
	Belthangady	**04**	9786	1.08	04
	Kadaba	**02**	4893	0.54	02
	Mangluru	**42**	102754	11.38	45
	Moodabidri	**07**	15193	1.68	07
	Puttur	**05**	12722	1.41	06
	Sullia	**02**	4893	0.54	02
		69			**74**
Total		**369**	**902728**	**100.00**	**400**

Source: Data Compiled as on 31.10.2021

11.6.4. Sampling Method and Sample Size of Banks' Employees:

(i) For Banks' Employees:

According to Yamane's (1967) formula for calculating sample size:

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n = Sample Size

N= Population size

e = Level of Precision

In which N = with ± 5 percent precision, Assuming 95 percent confidence level and e = 0.05

$$n = \frac{\mathbf{2336}}{1 + \mathbf{2336} * (0.05)^2}$$

n = **341.52** (Round off)

Therefore, an approximate sample size of banks' employees is **342.**

(ii) Sample Size of Banks' Employees:

The sample of population is divided into 'Strata' on the basis of the bank type and 'Strata' are further subdivided on the basis of the region as per rural, semi-urban, urban. To determine the sample size of banks' employees, the population ratio was considered as follows:

Table 12: Sample Size of Banks' Employees

Bank Name	Designation	Population	Ratio	Sample Size	Allotted Sample Size								
					Rural			Semi-Urban			Urban		
					Population	Ratio	Sample Size	Population	Ratio	Sample Size	Population	Ratio	Sample Size
BOB	Officer	375	16.05	55	102	27.20	15	56	14.93	08	217	57.87	32
	Clerical	210	8.99	31	90	42.86	13	50	23.81	07	70	33.33	11
Canara Bank	Officer	504	21.58	74	167	33.13	25	91	18.06	13	246	48.81	36
	Clerical	334	14.3	49	121	36.23	17	52	15.57	08	161	48.20	24
SBI	Officer	138	5.91	20	27	19.56	4	47	34.06	07	64	46.38	09
	Clerical	248	10.62	36	39	15.73	6	73	29.43	10	136	54.84	20
UBI	Officer	296	12.67	43	49	62.50	27	62	20.95	09	185	16.55	07
	Clerical	231	9.88	34	64	38.53	13	78	33.76	12	89	27.71	09
Total		**2336**	**100.00**	**342**			**120**			**74**			**148**

Source: Data Compiled as on 31.10.2021

11.7. DEVELOPMENT AND VALIDATION OF DATA COLLECTION INSTRUMENT:

The researcher has employed a structured questionnaire. As a result, validity and item reliability are two essential aspects of a questionnaire used in empirical research. Depending on the questionnaire's design, development, and aim, several scrutiny and statistical methodologies are used to evaluate its reliability and validity (Taherdoost, 2016). The researcher had to follow several processes to produce a high-quality questionnaire for this study. The current study, which incorporates two main techniques of data creation and data validation, is noteworthy which includes;

1. Validity Testing
2. Reliability Testing

11.8. RESEARCH TOOLS AND SOFTWARE PACKAGE USED:

In conducting research, various tools and software packages are utilized to enhance efficiency and accuracy. There are various research tools and software packages available to assist researchers in specific field of study. Here are some commonly used tools and software packages:

1. Reliability Test
2. Validity Test
3. Percentage Analysis
4. Descriptive Analysis
5. Independent Sample t-test
6. One-way ANOVA
7. Simple Linear Regression
8. Multiple Regression Analysis
9. Structural Equation Modeling (SEM) Mediating Effect

Software Package Used:

This study extensively used contemporary statistical methods, data, and several research database resources. This study extensively used IBM SPSS Statistics V26 is used to do descriptive and inferential analysis, including t-test, ANOVA, regression analysis, normality check, and others. IBM SPSS Amos 23 is used for for Structural Equation Modeling. The Data from previous research were collected and sourced using Zotero, Mendeley and MS Excel 2016, MS Word 2016 to produce basic frequency and two-way tables, two-or three-dimensional charts/diagrams, and various charts/diagrams.

12. CHAPTER SCHEME

The chapter scheme of the research study consists of six chapter are as follows:

Table 13: Chapter Scheme

Chapter	Title of the Chapter	Details of the Chapter
Chapter-I	Introduction	Focuses on the introduction of the research topic, significance and justification of the study, statement of problems, research questions, objectives of the study, hypotheses, scope of the study, limitations of the study and chapter scheme. Further, it covers the study's research design consisting of data types, tools for collecting data, reliability and validity of the questionnaire, statistical tools, sample design, sampling unit, sampling method and sample size, assumption testing and software used.
Chapter-II	Literature Review	Contains a review of the various research works on the different facets of banking and e-banking services.
Chapter-III	E-banking: Conceptual and Theoretical Framework	This chapter also discusses various concepts and theories, the evolution of e-banking banking, development of e-banking, different facets of e-banking, challenges and prospects of e-banking, and development of banking and e-banking and developed a conceptual research model for research study.
Chapter-IV	Driving Innovation in Financial Services: Exploring the Potential of E-banking Solutions	Concentrates on various aspects of banking and e-banking in global and national scenarios. Apart from the discussion on the conceptual and historical background of banking and e-banking, there will be a discussion on the phases and reforms of Indian Banking; Core Banking System; different facets of banking and e-banking: structure of Indian

		Banking, Recent Trends in Banking; E-banking development and growth globally; Role of nationalized bank on economic development and e-banking. E-services in India; Reports of various committees appointed by the reserve bank of India to implement e-banking in India; E-banking channels in india; and Banking profile of major nationalized banks in dakshina kannada district of karnataka state.
Chapter-V	Insights into E-banking: Examining Challenges and Prospects in Nationalized Banks of Dakshina Kannada District	Gives a comprehensive idea of the data of retail bank customer perspective. This includes results and discussion on the data-demographic profile of the respondents, awareness, number of users and non-users of e-banking from survey, frequency and purpose of e-banking services and products used by respondents, major enabling and disabling factors of e-banking, issues and challenges of respondents related to e-banking adoption, satisfaction of e-banking users and development factor identification. Provides primary analysis of customers' data through various statistical tools by covering demographical profile, present status of e-banking, issues and challenges of the e-banking and satisfaction on e-banking.
Chapter-VI	Summary of Findings, Suggestions and Conclusion	This chapter discusses the key conclusions about customer and banking data. It offers recommendations based on the findings and delivers a projected summary of the data that has been analysed. The chapter concludes with a brief remark that discusses the potential areas for further study in this field.

Source*:* Data Compiled by the Researcher

13. LIMITATIONS OF THE STUDY

Considering the fact that this study provides valuable contributions from the perspective of e-banking services, it has certain limitations:

- The data were collected from those retail banking customers who are availing the e-banking services of selected Nationalized Banks (Public Sector) resident of the Dakshina Kannada district and the analysis focused entirely on retail e-banking services, with no consideration given to corporate banking account holders.
- Bank customers' and bank employees' intentions, attitudes, and beliefs may differ across the various areas viz., Bantwal, Belthangady, Kadaba, Mangaluru, Moodabidri, Puttur, and Sullia.
- In customer perspective, the research is limited to retail e-banking services such as ATM, Debit Card, Credit Card, Net banking, Mobile/ SMS Banking only. These services are classified as a self-service when bank customers are not necessary to visit a branch to perform the above-mentioned services.
- Users of smart cards or prepaid cards were not identified in this research study.
- In banker's perspective, the bank staff is directly involved in e-banking services supplied by banks, such as EFTPOS, ECS, CTS, and other e-banking product and services are taken into account in this study.

14. FINDINGS OF THE STUDY

PART A- KEY FINDINGS ON E-BANKING CUSTOMERS

14.1. Key Findings on Customer Profile:

- ✧ It was found in the research study that the Majority 46.5 percent of respondents belong to the age group of 18-30 years, 31.3 percent of respondents are aged between 31-40 years.
- ✧ The result of the empirical study showed that the majority 62.0 percent of respondents are male, whereas 38.0 percent of respondents are female.
- ✧ It was found in the research study that the Majority 42.3 percent of respondents are unmarried, 56.0 percent of respondents are married.

- ✧ It was observed that the majority 48.0 percent of respondents are graduated, 29.0 percent of respondents are post-graduated, and 7.5 percent of respondents are above post-graduated.
- ✧ In this study, it was found that 17.0 percent of respondents are Professionals/faculty, 32.0 percent of respondents are private employees, and 16.8 percent of respondents are public employee.
- ✧ Majority (61.0 percent) of respondents have the monthly income of above Rs.25,001.
- ✧ It was found through the analysis that 27.5 percent of respondents are from rural area, 23.0 percent of respondents are from semi-urban area, 49.5 percent of respondents are from urban areas.
- ✧ The research revealed that Majority 55.3 percent of respondents belong to Mangaluru region, and 12.5 percent of respondents belong to Bantwal region.
- ✧ The study shows that, 22.0 percent of respondents have their bank account in Bank of Baroda, 43.3 percent of respondents in Canara bank
- ✧ The survey revealed that the majority 65.5 percent of respondents visit the bank occasionally, 20.5 percent of respondents visit the bank monthly.
- ✧ It was found through the analysis that 72.0 percent of the respondents visit bank branch to activation or request of services.
- ✧ It was observed that the majority 77.0 percent of the respondents visit bank branch to deposit/withdrawal.
- ✧ The result of the empirical study showed that the majority 66.0 percent of the respondents visit bank branch to make passbook entry/statement of account.
- ✧ It was found through the analysis that 87.0 percent of the respondents have used ATM services and Debit cards for more than 5 years; 73.0 percent of respondents have not accessed credit card.
- ✧ The study shows that, 54.0 percent of respondents accessed the mobile banking services for more than 5 years; 66.0 percent respondents not accessed the Net banking services.
- ✧ Bank encourages respondents to use e-banking services by providing face to face interaction (64 percent), rewards (38 percent), calls (38.8 percent), direct mail (27 percent) and so on.
- ✧ The result of the empirical study showed that the majority 100.0 percent of respondents get the knowledge of e-banking services through bank employees;

87.7 percent of respondents get the knowledge of e-banking services through mail/ SMS and 57.0 percent of respondents get the knowledge of e-banking services through display board or notice board at the branch

- ✧ It was observed that the 59 percent of the customers report the e-banking problem to the concerned authority, out of which 83.1 percent of respondents reported the problems to the regional office.
- ✧ The customers view on e-banking problem encountered and reported to the concerned authority showed that 97.0 percent of the respondents reported that they had Server/Network Issues; 93.5 percent of respondents reported 'No SMS updates'; 91.3 percent of respondents reported that they had Too many steps in processing transaction.

14.2. KEY FINDINGS ON CUSTOMER OPINION WITH RESPECT TO E-BANKING:

14.2.1. Problems Faced During Demonetization, Covid-19 and Merger with Respect to E-banking:

- ✧ In case of Demonetisation, the relatively extreme problems faced by the customers were Fund transfer (M=3.33).
- ✧ When it comes to COVID-19 the relatively extreme problems faced by the customers were ATM service availability (M=3.80).
- ✧ As far as Merger is concerned, the relatively extreme problems faced by the customers were Fund transfer (M= 2.59).

14.2.2. Reason for Not Being Aware of E-banking Services:

- ✧ Most (44 percent) of the customers are not aware of credit card services due to a lack of awareness (low literacy rates in day to day financial activity) and 41 percent of them state they are not interested in services.
- ✧ Most (37 percent) of the customers are not aware of the net banking services due to a lack of guidance and 35 percent of them state a lack of awareness (low literacy rates in day-to-day financial activity).
- ✧ Majority 19 percent of the customers are not aware of mobile banking services due to lack of guidance, fear of using e-channel, and not being interested in services.

14.2.3. Awareness of E-banking Services:

- ✧ When it comes to awareness level on ATM services, Customers have a Good awareness level on Understanding and Learning of the E-channel Services (M=3.81) compared to Awareness of E-channel service with new technology and Use of support applications or apps (M=3.60), Awareness of services charges (M=2.86). However, Awareness of the scam (threat), security, and confidentiality of the Services (M=2.80) found to be low level of awareness on ATM services.
- ✧ When it comes to Debit card services, customers have a relatively good awareness level on Understanding and Learning of the E-channel Services (M=4.06). But, Awareness of services charges (M=2.96) found to be a low level of awareness on Debit card services.
- ✧ As far as Credit card services are concerned, customers have a relatively good awareness level on Understanding and Learning of the E-channel Services (M=3.62) compared to Awareness of E-channel services with new technology and Use of support applications or apps (M=3.16). But, Awareness of services charges (M=2.22) found to be low level of awareness on Credit card services.
- ✧ In case of Net banking services, customers have relatively good awareness level on Awareness of E-channel service with new technology and Use of support applications or apps (M=3.47). However, Awareness of the scam (threat), security and confidentiality of the Services (M=2.53) found to be low level of awareness on Net banking services.
- ✧ When it comes to Mobile Banking services, customers have relatively good awareness level on Understanding and Learning of the E-channel Services (M=3.99). However, Awareness of the scam (threat), security and confidentiality of the Services (M=2.49) found to low level of awareness on Mobile Banking services.

14.2.4. Banking Strategies that helped the Customers to adopt the E-banking Services:

- ✧ Customers have strongly agreed that they have adopted ATM services because it is Time-saving (M=4.23).
- ✧ Yet, customers showed low agreement level on Varieties of Service (M=1.94); Rewards and offers (M=2.05) as a banking strategy which influenced them to adopt ATM services.

- ✧ When it comes to Debit card services, customers have strongly agreed that they have adopted Debit card services because it provides 24 X 7 Service (M=4.29).
- ✧ However, customer showed comparatively low agreement level on Varieties of Service (M= 2.26) as a banking strategy which influenced them to adopt Debit card services.
- ✧ Customers have strongly agreed that they have adopted Credit card services because it is it is convenient to access and time-saving (M=4.11).
- ✧ However, customer showed a comparatively low agreement level on Varieties of Service (M= 2.04) as a banking strategy which influenced them to adopt Credit Card services.
- ✧ Customers have strongly agreed that they have adopted Net-banking services, because it provides Varieties of Service (M=4.35).
- ✧ Yet, customers showed low agreement level on It is easy to understand (M= 3.38) as a banking strategy which influenced them to adopt Net-banking services.
- ✧ With respect to Mobile Banking services, customers have strongly agreed that they have adopted Mobile Banking services, because It is convenient to access (M=4.50).
- ✧ But, customer showed low agreement level on Rewards and offers (M= 3.22) as a banking strategy which influenced them to adopt Mobile Banking services.

14.2.5. Utilization of Financial E-banking Services:

(a). Level of Utilization of Financial ATM Services:

- ✧ Customers highly utilise financial ATM services for the purpose of Cash Withdrawal (M=4).
- ✧ But utilisation of financial ATM services for other purposes such as Mobile Recharge (M=1), Payment of Income tax (M=1), Payment of Insurance premium (M=1) and other e-payment (M=1) seemed to be lower.

(b). Level of Utilization of Financial Debit Cards Services:

- ✧ Customers highly utilise financial Debit card services for the purpose of Withdraw (M= 4.24).
- ✧ But Bill payment: credit card due (M= 1.12) found to be the least utilised Financial Debit Cards services.

(c). Level of Utilization of Financial Credit Cards Services:

- ✧ Customers highly utilise financial Credit Card services for the purpose of Shopping (M= 4.37).
- ✧ But Cash withdrawing and Paying Tax (M= 1.00) found to be the least utilised Financial credit cards services.

(d). Level of Utilization of Financial Net Banking Services:

- ✧ Customers highly utilise financial Net-banking services for the purpose of Fund transfer through IMPS (M= 3.56).
- ✧ However, Transfer of Funds through RTGS (M= 1.50) found to be the least utilised Financial Net-banking services.

(e). Level of Utilization of Financial Mobile Banking Services:

- ✧ Customers highly utilise financial Mobile banking services for the purpose of QR code Scan and Paying (M=4.27).
- ✧ But, Transfer of Funds through RTGS (M=1.74) found be to be the least utilised Financial Mobile-banking service.

14.2.6. Utilization of Non-Financial E-banking Services:

(a). Level of Utilization of Non-Financial ATM Services:

- ✧ Customers highly utilise Non-financial ATM services for the purpose of Balance Enquiry (M= 4.03).
- ✧ However, Mobile banking Registration, Biometric login, and Card: Cancel and block (M= 1.00) found to be the least utilised Financial ATM services.

(b). Level of Utilization of Non-Financial Debit Card Services:

- ✧ Customers highly utilise Non-Financial Debit Card Services for the purpose of Checking balance details through ATMs/NET/Mobile App (M=2.95).
- ✧ Yet, Reward/Reward point (M=1.17) found to be the least utilised Non-Financial Debit Card Services.

(c). Level of Utilization of Non-Financial Credit Card Services:

- ✧ Customers highly utilise Non-Financial Credit Card Services for the purpose of Checking balance details through ATMs/NET/Mobile App (M=3.89).

- ✧ Yet, Reward/Reward point (M=2.07) found to be the least utilised Non-Financial Credit Card Services.

(d). Level of Utilization of Non-Financial Net Banking Services:

- ✧ Customers highly utilise Non-Financial Net-banking Services for the purpose of Edit and manage the profile of bank account (M=3.73) compared to Balance inquiry/ Mini Statement (M=3.53), User Login ID Retrieval and Resetting of Passwords (M=3.15).
- ✧ But, utilisation of Non-Financial Net Banking Services for Opening and Closing FD/RD/PPF (M=1.09) and Cheque book request/Cancel of cheque book (M=1.06) found be very low.

(e). Level of Utilization of Non-Financial Mobile Banking Services:

- ✧ Customers highly utilise Non-Financial mobile banking Services for the purpose of Balance inquiry/ Mini Statement (M= 4.43).
- ✧ However, Issue of account statement for maximum of 6 months through post or e-mail, Stop payment of Cheque and Loan-related Enquiry (M=1.00) found to be the least utilised Non-Financial mobile banking Services.

14.2.7. Reason for Non-Utilization of E-banking Services:

- ✧ Most (65 percent) of the customers are not utilizing Credit Card as they are Not Interested and consider not necessary and 58.8% of them state Charges of Service.
- ✧ Only few (7.8 percent) considered Preference for traditional modes of banking being the reason for not utilizing Credit card services.
- ✧ Most (64 percent) of the customers are not utilizing net banking as they are Not Interested and consider it not necessary and 43 percent of them state Complexity/Difficulty in using.
- ✧ Only few (1 percent) considered Charges of Service being the reason for not utilizing net banking.
- ✧ Most (23 percent) of the customers are not utilizing Mobile banking as they are Not Interested and consider not necessary; 22 percent of them state Complexity/Difficulty in using; and 22 percent of them state Privacy and Security concerns.
- ✧ Only a few (5 percent) considered Preference for traditional modes of banking being the reason for not utilizing mobile banking.

14.2.8. Issues and Challenges of E-banking Services:

(a). Issues Concerning Technical Factors of E-banking Services:

- ✧ In case of ATM services, System Failure/Out of services/The machine runs out of cash (M=3.68) are considered as the major technical challenge of e-banking. However, Wrong Denomination of cash received (M=1.00) found to be the minor technical challenge faced by the customers.
- ✧ When it comes to Debit card services, Network Connectivity issues (M=2.96) are considered as the major technical challenge of e-banking. But, Statement of transaction (M= 1.12) found to be the minor technical challenge faced by the customers.
- ✧ As far as Credit card services are concerned, Transaction in a multiple attempt (M=3.75) are considered as the major technical challenge of e-banking. Yet, Lock/Blockage of card (M= 1.04) found to be the minor technical challenge faced by the customers.
- ✧ Moreover, Net banking services, Denied/ Possibility of errors (M= 3.02) are considered as the major technical challenge of e-banking. However, Lock/Blockage of card (M= 1.03) found to be the minor technical challenge faced by the customers.
- ✧ In case of mobile banking services, System Failure/Out of services/The machine runs out of cash(M=3.12) are considered as the major technical challenge. But, Lock/Blockage of card (M= 1.00) found to be the minor technical challenge faced by the customers.

(b). Issues concerning Operating and Knowledge Factor of E-banking Services:

- ✧ In case of ATM services, Transactional procedures are complicated (M=3.07) are considered as the major Operating and Knowledge challenge. Difficulty in transferring funds (M= 1.00) found to be the minor Operating and Knowledge challenge faced by the customers.
- ✧ When it comes to Debit card services, Time-consuming for operating (M=2.87) are considered as the major Operating and Knowledge challenge. Difficulty for withdraw (M= 1.06) found to be the minor Operating and Knowledge challenge faced by the customers.
- ✧ As far as for Credit card services, Transactional procedures are complicated (M=2.42) are considered as the major Operating and Knowledge challenge. But,

Time-consuming for operating (M= 1.00) found to be the minor Operating and Knowledge challenge faced by the customers.

- ✧ In case of Net banking services, Remembering the Pin/Password/login ID (M=3.46) are considered as the major Operating and Knowledge challenge. Difficulty in transferring funds (M= 2.54) found to be the minor Operating and Knowledge challenge faced by the customer.
- ✧ Moreover for Mobile banking services, Transactional procedures are complicated (M=2.51) are considered as the major Operating and Knowledge challenge. However, Time-consuming for operating (M= 1.60) found to be the minor Operating and Knowledge challenge faced by the customers.

(c). Issues concerning Strategic Factor of E-banking Services:

- ✧ In case of ATM services, Lack of 24/7 service (M=3.52) are considered as the major Strategic challenge of e-banking. The minor strategic challenge faced by customers is Issues in customer care service/back-end (M=1.07).
- ✧ In case of debit card, Issues in customer care service/back-end (M=1.21) are considered the major strategic challenge. Visibility of information on card (M=1.00) is the minor strategic challenge faced by customers.
- ✧ As far as for credit card services, Lack of appropriate software (M=3.70) are considered as the major Strategic challenge. But, Visibility of information on card (M= 1.00) found to be the minor Strategic challenge faced by the customers.
- ✧ In case of Net banking services, customers showed low level of strategic challenges such as Lack of appropriate software (M=1.51), Issues in payments reverse entry (M=1.46), Lack of facility and infrastructure (M=1.44) and Updating of bank's website (M=1.00).
- ✧ In case of mobile banking services, Lack of appropriate software (M=3.43) are considered as the major strategic challenge. But, Issues in Customer care service/back-end (M= 1.09) found to be the minor Strategic challenge.

(d). Issues Concerning Economic Financial Factor of E-banking Services:

- ✧ In case of ATM services, High charges for inter-bank transactions (M= 2.89) are considered as the major Financial challenge. However, High service charge other than transaction (M= 1.00) found to be the minor financial challenge.
- ✧ When it comes to Debit card services, Limit on daily withdrawal (M=2.77) are considered as the major Financial challenge. But, High service charges other than

transaction (M= 1.00) found to be a minor financial challenge faced by the customers.

- ✧ As far as for Credit card services, Pay the due balance amounts (M=3.08) are considered as the major Financial challenge. Yet, High service charge other than transaction (M= 1.00) found to be the minor financial challenge faced by the customers.
- ✧ Moreover, for Net banking services, Limit on daily withdrawal (M=2.90) are considered as the major Financial challenge of e-banking. However, High service charge other than transaction (M= 1.18) found to be the minor financial challenge faced by the customers.
- ✧ In case of Mobile banking services, Limit on daily withdrawal (M=1.29) are considered as the major Financial challenge of e-banking. But, High service charge other than transaction (M=1.00) found to be the minor financial challenge faced by the customers.

(e). Issues Concerning Security and Privacy Factor of E-banking Services:

- ✧ In case of ATM services, Another person entering ATMs (M=3.80) is considered the major security and privacy challenge in e-banking. The minor security and privacy challenge faced by customers is the threat during transactions (M=1.74).
- ✧ When it comes to debit card services, The major security and privacy challenges in e-banking are the fear of stealing information (M=2.42). The minor security and privacy challenge faced by customers is the threat during transactions (M=1.67).
- ✧ As far as for credit card services is concerned, The major security and privacy challenge in e-banking is the fear of losing a card (M=3.30). The minor security and privacy challenge faced by customers is the threat during transactions (M=1.21).
- ✧ Moreover, for net banking services, The major security and privacy challenge in e-banking is the fear of stealing information (M=3.02). The minor security and privacy challenge faced by customers is the protection provided by firewalls and gateways (M=1.03).
- ✧ When it comes to Mobile banking services, The major security and privacy challenge in e-banking is the lack of updates and security alerts sent by banks on

a regular basis (M=2.10). The minor security and privacy challenge faced by customers is the protection provided by firewalls and gateways (M=1.00).

14.2.9. Customer Satisfaction:

(a). Customer Satisfaction on ATM Services:

- ✧ Customers showed relatively high satisfaction level on Navigation of ATM services (M=4.02), Grievance Settlement (M=3.99), Voice direction (M=3.70). But, customers showed low level of satisfaction on Withdrawal Limits (M=2.20).

(b). Customer Satisfaction on Debit Card Services:

- ✧ Customers showed relatively high satisfaction level on Usefulness of Debit card services (M=4.14), Withdrawal/Deposit (Correctness/Promptness) (M=4.03) compared to Deposit/withdrawal by using with POS machine (M=3.88). Yet, customers showed low level of satisfaction on Rewards/Reward points (M= 2.77).

(c). Customer Satisfaction on Credit Cards Services:

- ✧ Customers showed relatively high satisfaction level on Usefulness (M=4.26), Periodic statements (M=4.14), Shopping and making other payments (M=4.07). However customers showed low level of satisfaction on Attractive rewards (M= 2.22).

(d). Customer Satisfaction on Net Banking:

- ✧ Customers showed relatively high satisfaction level on View Balance and account details (M=4.06). Yet customers showed low level of satisfaction on Offers and gift cards (M= 2.23). availing Information of product and services, Privacy and security, Other online payments, Fund transfer by IMPS, Bank web site supports for multiple browsers, 24/7 availability of bank website, Content, organized information as all the mean value fund to be (M=4.00).

(e). Customer satisfaction on Mobile Banking:

- ✧ Customers showed relatively high satisfaction level on E-Payment via NFC, QR, or Barcode Scanner (M=4.23), View Balance and account details (M=4.08), Transactions status (M=4.06). Yet customers showed low level of satisfaction on Offers and gift cards (M= 1.85).

14.2.10. Development Strategy and Future Direction:

(a). Development Strategy and Future Direction for ATM Services:

- ✧ Customers consider Increasing the maximum amount that can be withdrawn in a day (M=4.42) and to Increase of safety and security (M=4.40) to be the important development strategy with respect to ATM services. However, customers showed low level of importance to More spacious room (M=1.82).

(b). Development Strategy and Future Direction for Debit Card:

- ✧ Customers consider having the Card access via a digit passcode (M=4.47) to be the important development strategy with respect to debit card. But, customers showed low level of importance for Requirement of Near-Field Communication (NFC)/Contactless card payment (M= 3.75).

(c). Development Strategy and Future Direction for Credit Card:

- ✧ Customers consider having the Card access via a digit passcode (M=4.30) to be the important development strategy with respect to credit card. Yet, customers showed low level of importance on having Card access via a fingerprint touch ID (M= 2.78).

(d). Development Strategy and Future Direction for Net Banking:

- ✧ Customers consider availing financial calculators for EMI, premium, and other (M= 4.47) and Instant money transfer to any bank in the world (M= 4.44) to be the important development strategy with respect to net banking. Yet, customers showed low level of importance on having Login authentication based on the eyes verification (M= 1.36).

(e). Development Strategy and Future Direction for Mobile Banking:

- ✧ Customers consider ATM withdrawals realization with QR technology (M=4.39), to Search nearest ATM and use GPS navigation (M=4.29) compared to Fast way to check account balances and transaction history (M=4.27) to be the important development strategy with respect to mobile banking. However, customers showed low level of importance for Face recognition through the mobile device to make a transaction (M= 1.13).

14.3. Key Findings on Inferential Analysis:

Table 14: One-way ANOVA and Independent Sample t-test Results

Sl. No	Hypotheses	Demographic/Bank Profile	Test	Result
1.	H1: Demographic and bank profile of the customers significantly determines their awareness, adoption/utilization, satisfaction level on e-banking.	**H1.1 Awareness on E-banking**		H1 is Accepted.
		Age	0.0438	
		Gender	.020	
		Marital Status	.001	
		Educational Status	.031	
		Occupation	.000	
		Monthly Income	.000	
		Residential Area	.047	
		Region (Taluk)	0.09	
		Bank Name	.001	
		Frequency of Bank Visit	0.568	
		Duration of Using E-banking Services	.228	
		H1.2 Utilization		
		Age	.001	
		Gender	2.6	
		Marital Status	.000	
		Educational Status	.167	
		Occupation	.002	
		Monthly Income	.000	
		Residential Area	0.4102	
		Region (Taluk)	.193	
		Bank Name	.283	
		Frequency of Bank Visit	.659	
		H1.3 Satisfaction		
		Age	.016	
		Gender	0.1974	
		Marital Status	.083	
		Educational Status	0.175	
		Occupation	0.2346	
		Monthly Income	0.043	
		Residential Area	.385	
		Region (Taluk)	.100	
		Bank Name	0.0042	
		Frequency of Bank Visit	0.04006	

2.	H2: Issues and challenges faced by the customers due to demonetization, COVID-19, merger are significantly different among their bank profile.	**Bank name**		H2 is Accepted.
		Demonetization	.004	
		COVID-19 Pandemic	.276	
		Merger	.000	
		Bank Visit		
		Demonetization	.001	
		COVID-19 Pandemic	.023	
		Merger	.060	
		Duration of Using E-banking Services		
		Demonetization	.310	
		COVID-19 Pandemic	.002	
		Merger	.009	
3.	H3: Issues and challenges in the usage e-banking services are associated with the banking profile of customers.	Bank name	0.0358	H3 is Rejected.
		Bank Visit	.675	
		Duration of Using E-banking Services	0.0942	
4.	H4: Highly aware customers utilize the e-banking services to the greatest extent.	ATM	.442	H4 is Accepted.
		Debit Card	.000	
		Credit Card	.000	
		Net Banking	.000	
		Mobile Banking	.000	
		Overall	.000	

Table 15: Findings on Regression Analysis

Sl. No	Hypotheses	Variable	Test	Result
1.	H5: Customer satisfaction on e-banking is significantly influenced by their utilisation level.	ATM	.074	H5 is Accepted.
		Debit Card	.000	
		Credit Card	.057	
		Net Banking	.000	
		Mobile Banking	.000	
		Overall	.001	
2.	H6: Banking strategies significantly determines the adoption level of e-banking.	Utilization	.003	H6 is Accepted.
3.	H8: Impact of e-banking adoption on customer satisfaction is high when they face low level of issues and challenges.	Low	.001	H8 is Accepted.
		Moderate	.493	
		High	.631	
4.	H9: Customer satisfaction and challenges significantly influences the future development strategy for retail e-banking.	Customer satisfaction	.000	H9 is Accepted.
		Issues and Challenges	.001	

Major Findings on Structural Equation Modelling (SEM):

Table 16: SEM Results

Sl.No	Hypotheses	Relationship	Estimates	P	Result
1.	H7: Adoption of e banking services highly contributes to customer satisfaction when it is mediated by banking strategies.	Banking strategy <-- Adoption of E-banking	.188	HS	H7 is Accepted.
		Satisfaction <--- Banking strategy	.261	HS	
		Satisfaction <--- Adoption of E-banking	.231	HS	
		Effect (Total)	.265	0.000**	
		Effect (Direct)	.219	0.000**	
		Effect (Indirect)	.046	0.000**	

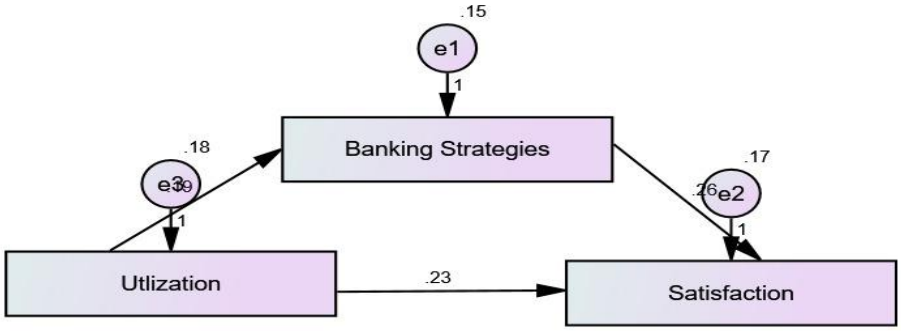


Figure 3: Banking Strategies as a Mediator between Adoption of E-Banking Services and Customer Satisfaction

PART-B: KEY FINDINGS ON BANKS EMPLOYEES

14.4. Key Findings on Banker Profile:

- ✧ It was observed that the majority 47.1 percent of respondents belong to 26-40 years of age category and 38.3 percent of respondents belong to 40-60 years.
- ✧ The result of survey revealed that the Majority of the respondents are Male (64.9 percent) than females.
- ✧ It was found in the research study that the majority 75.1 percent of respondents are graduates and 17.8 percent of respondents are post graduates.
- ✧ It was observed that the majority 60.2 percent of respondents are working as officers, whereas 39.8 percent of respondents are working as a clerk.
- ✧ In this study it was found that majority 40.1 percent of respondents have an experience of 11-15 years in bank and 27.8 percent of respondents have an experience of 6-10 years.

- ✧ The analysis reveled that tha majority 51.8 percent of respondents earn Rs.40,001 to Rs.80,000 on a monthly basis, whereas, 37.4 percent of respondents earn Rs.80,001 to Rs. 1,20,000.
- ✧ The research shows that the majority 36.0 percent of respondents are working in Canara Bank; 25.1 percent of them are working in Bank of Baroda and 22.5 percent of respondents are working in Union Bank of India.
- ✧ It was found through the research that the majority 55.6 percent of the employees belong to Mangaluru branch and 12.3 percent of them belong to Bantval.
- ✧ The study shows, 35.1 percent of banks are located in rural areas, 21.6 percent of banks are located in semi-urban areas, whereas, 43.3 percent of banks are located in urban areas.
- ✧ The banks are providing 100 percent of their services while Opening the new bank account, while customer cross-selling is done, when solely requests are made by customers, and while notice posted on the Branch Noticeboard.

14.5. Key Findings on Bankers' Opinion with respect to E-banking:

(a). Extent of E-banking Channels' Effectiveness on Banking Operations:

- ✧ Withdrawals (M=4.76) is the highest rated statement followed by Account Enquiry (M=4.27). Service Request (Cancel Debit card/Credit card/Smart card, open FD/RD, download application, and so on) (M=2.49) seems to be the least mean rated statement.

(b). Impact of E-banking on Banks' Performance:

- ✧ More profits than manual banking followed by a Superior system than Manual banking (M=4.85) seems to be the most rated mean statement. The current status of the e-banking system enhanced the better customer-banker relationship (M=3.04) seems to be the least mean rated statement.

(c). Employees' Daily Activities and Workload:

- ✧ High Security and Privacy (M=4.38) seems to be the most rated mean statement. Work has become easier and the workload has decreased (M=2.83) seems to be the least rated mean statement.

(d). Opinion on Most Efficient and Fastest way of Electronic Delivery Channels:

- ✧ Mobile/SMS banking (M=9.96) most rated mean, Smart Card (M=1.65) seems to be the least rated mean.

(e). Media that Promotes E-banking Products and Services to Customers:

- ✧ Most mean rated media that promotes e-banking products and services to customers is E-mail/SMS sent to mobile (M=4.00) and Magazine (M=1.99) likely seems to be the least mean rated media.

(d). Strategies that use for the Promotional Activity about the E-banking Service to Bank Customers:

- ✧ The most mean-rated strategies use for promotional activity about the e-banking service to bank customers is, providing 24*7 e-banking services and Provide training courses regarding the use of e-banking services to customers (M=1.68) seems to be least mean rated strategy.

(e). Complaints from the Customers regarding E-banking Services:

- ✧ The most mean rated complaint is Fraud call (M=3.34) and Torn notes being delivered at the ATM Machine (M=1.68) seems to be the least mean rated complaint.

(f). Issue and Challenges Banks face with the E-banking System:

- ✧ Most mean rated Systematic (Hardware/Software) challenge is 'Installing hardware systems at the branch is very low due to the high cost' (M=3.25).
- ✧ Highest rated Social-cultural challenges is the 'lack of confidence in the e-banking system among different segments of the population' (M=3.88).
- ✧ 'Banks have separate departments to manage e-banking frauds' (M=4.36) seems to be the highest rated Organisation and Process challenges
- ✧ 'Insufficient Staff development of related fields and by emerging' (M=3.81) shows the most mean rated Knowledge and Educational challenges.
- ✧ 'Weak telecommunication in bank/ Break down/ Slow internet connection' shows the most mean rated Infrastructure challenges.
- ✧ 'Electronic banking frauds are increasing due to customer's not taking precautions' (M=4.29) seems to be the mean rated Security and Privacy Challenges.

- ✧ ‘All financial operations in e-banking are carried out online, but written documents are authentic in the modern legal framework’ (M=3.78) is the highest rated Legal and Regulatory challenges.
- ✧ ‘Phishing over the phone and SMS’ (M=4.00) has the most rated mean on scamming.

(g). Employee Satisfaction with working in an Electronic Delivery Channel:

- ✧ Improved working conditions in the bank (M=4.48) have the highest rated statement followed by Reduced workload (M=4.20), Empower to solve the problems and Reduced confusion (M=4.12), Work without errors (M=4.10), Increased interest to work (M=4.04) followed by few more.
- ✧ Supervisor’s Guidance and suggestions (M=3.20) is the least mean rated statement.

14.6. Key Findings on Inferential Analysis:

Table 17: One-way ANOVA and Independent Sample t-test Results

Sl. No.	Hypotheses	Demographic/bank profile	Test	Result
1.	H10: Bank employees’ satisfaction and challenges with respect to e-banking is significantly influenced by their demographic profile.	**Satisfaction on E-banking**		H10 is Rejected.
		Age	.312	
		Gender	.004	
		Educational Status	.961	
		Designation	.022	
		Monthly Income	.000	
		Bank Name	.731	
		Branch (Taluk)	.565	
		Inhabited Area	.428	
		Issues and Challenges of E-Banking		
		Age	.925	
		Gender	.109	
		Educational Status	.852	
		Designation	.388	
		Monthly Income	.502	
		Bank Name	.404	
		Branch (Taluk)	.056	
		Inhabited Area	.033	

Table 18: Findings on Regression Analysis

Sl. No	Hypotheses	Variable	Test	Result
1.	H11: Bank performance is the result of promotional activities and Medias used by the banks.	Medias	.041	H11 is Accepted.
		Strategies	.038	
2	H12: Issues, challenges and banks scam diminishes bank performance and increases work load.	Bank Performance	.047	H12 is Accepted.
		Workload	.043	
3	H13: Employees satisfaction on e-banking is significantly determined by their bank performance and work load.	Satisfaction on E-banking	.001	H13 is Accepted.
4	H14: Level of challenges can significantly alter the impact of bank performance and employees' workload on their satisfaction.	High	.095	H14 is Accepted.
		Moderate	.178	
		Low	.000	

15. SUGGESTIONS

15.1. Suggestions for Banks:

- ✧ Respondents visit the bank occasionally (64.5 percent) has a highly significant influence because of many reasons such as widely using of e-banking services or not interested in visiting the bank. In this case bank should promote the services continually through electronic media and suggest their customer about e-banking services if they needed information without interrupted.
- ✧ Most of the respondents visit bank branch to make deposit/withdrawals (77 percent). In this case bank should advise and educate their customer to use more e-channels and increases the infrastructure facility like ATM/Cash deposit machine.
- ✧ The study found that 97.0 percent of e-banking problems were server or network issues, while 93.5 percent reported no SMS updates. Additionally, 91.3 percent reported too many steps in transaction processing. In this regard, the bank should take immediate action to address these issues. It is crucial for the bank to improve their server and network infrastructure to ensure smooth electronic banking services. Additionally, they should streamline the transaction process and provide

timely SMS updates to enhance customer satisfaction and trust in their e-banking system.

- ✧ As per the study in case of ATM services, System Failure/Out of services/The machine runs out of cash are considered as the major technical challenge faced by the customers, the banks should make an arrangement for sufficient cash availability in the ATMs.
- ✧ As far as Credit card services are concerned, Transaction in a multiple attempt are considered as the major technical challenge of e-banking. Hence, it is essential for banks to adopt new technological advancement in their banking operation which may tackle these technical glitches.
- ✧ Denied/ Possibility of errors, complicated Transactional procedures, Lack of appropriate software are the major technical glitches as per the study. By considering these issues, the bank should make an investment on technological advancement to bring error free transaction and to provide smooth banking experience.
- ✧ In case of ATM services, High charges for inter-bank transactions are considered as the major financial challenge, to tackle this challenge each bank should increase the number of ATMs in all the localities of each region.
- ✧ In case of ATM services, another person enters the ATMs are considered as the major Security and Privacy challenge. Hence, bank should appoint a watchman in each ATMs of their respective banks with the clear instruction of securing customers privacy when they are using ATM facility.
- ✧ As per the findings customers showed low level of satisfaction on Attractive rewards, Offers and gift cards on using e-banking, which shows insignificant promotional strategy conducted by the banks. Hence, it is recommended by the bankers to adopt aggressive marketing by providing attractive rewards and gifts.
- ✧ As per the findings, customers consider ATM withdrawals realization with QR technology and to Search nearest ATM and use GPS navigation to be the important development strategy with respect to mobile banking. Hence, bankers should take an attempt to introduce these developments.

- ✧ As per the findings, customers consider availing financial calculators for EMI, premium, and other and instant money transfer to any bank in the world to be the important development strategy with respect to net banking. Hence, bankers should implement these features in their e-banking services.
- ✧ Banks are still a long way from achieving the full potential of their channels. The study found that the customers' understanding of all e-banking channels is average. Hence, bank must continuously monitor and be watchful in order to raise customer awareness of their services, keep them informed about their product and services, and ensure that they are satisfied with the inner-quality improvements they have made. Increase awareness of e-banking services, the bank has to run a successful marketing campaign.
- ✧ In order better to reach the customers, have a competitive service charges, require lower minimum balances, and so on, banks should offer increase good service efficiency in ATM services, Debit card, credit card, Net banking and mobile banking services, and any other service in e-banking services. Banks should take the required actions to make using e-banking services simpler and more user-friendly.
- ✧ Banking strategies i.e., Rewards, Offers/ Discount, Training program, Video content drives, Referral platform, brochure of e-banking product and services, social media content, bank call, direct mailing and blogging are less than 38 percent. So, bank should make a strong marketing strategy to promote the e-banking services. In this connection, Banks should offer incentives like gift vouchers, loyalty rewards and special benefits to frequent e-banking services users.
- ✧ The bank should raise the maximum amount that may be withdrawn from an ATM because the current limit is too low. Customers find it very challenging since banks charge for cash withdrawals that go above the limit.
- ✧ The Board of Directors and Senior Management should oversee the implementation of a safe and sound e-banking operations environment, as the study found that Issues, challenges and banks scam diminishes bank performance and increases work load.

- ✧ The bank need to be committed to the process of consumer education initiatives by providing adequate resources, evaluating the effectiveness of the process and fine-tuning and improving customer education measures on an ongoing basis.
- ✧ The awareness programmes should be customized for the specific audience, it is important to identify and segment the target users for the programmes.
- ✧ Evaluation of the effects of various campaigns for specific target groups can be measured through qualitative (e.g., focus groups, interviews) and/or quantitative (e.g., questionnaires, omnibus surveys) research. Evaluation against metrics, performance objectives, etc., should also be conducted to check the campaign's effectiveness, and to establish lessons learned to improve future initiatives.
- ✧ Banks should analyse their IT operation environment, including technology, human resources and implemented processes to identify threats and vulnerabilities and conduct a periodic risk assessment. As part of risk identification and assessment, banks should identify events or activities that could disrupt operations or negatively affect reputation or earnings and assess compliance to regulatory requirements. Banks should define various attributes for each risk component.
- ✧ Banks must be required to report to the regulator where the scale and nature of functions outsourced are significant, or extensive data sharing is involved across geographic locations as part of technology e-banking process outsourcing.
- ✧ The terms and conditions governing the contract between the bank and the service provider should be carefully defined in written agreements and vetted by the bank's legal counsel on their legal effect and enforceability.
- ✧ The bank needs to be adequately aware of e-banking resources and infrastructure available to meet required strategic business objectives and ensure that a process is in place to record the resources available/ potentially available to the bank.
- ✧ Performance of e-banking function should be monitored to ensure delivery on time and within budget, with appropriate functionality and with intended benefits.
- ✧ Based on research studies and interviews with bank managers and experts, here are some general suggestions for bankers to enhance their e-banking services:

- The banking sector need to provide free training sessions, demonstrations, seminars, and workshops on electronic banking access for the general public in order to raise people's understanding of the topic. This is due to the fact that they have the potential to become customers of the financial institutions in the future.
- To keep customers satisfied in the present and in the future, complaints and recommendations from users should be scrutinised with sincerity, and solutions are needed. The retention rate of electronic banking customers should also be monitored on a regular basis.
- In order to maximize customer satisfaction, banks must conduct periodic evaluations of their technology in comparison to the costs. If they are merely concerned about updating technology, their cost will likely increase, and this will in turn increase customer burdens.
- Provide multiple channels for customer support, including live chat, email, and phone assistance, to promptly address customer queries and concerns.
- Customers are concerned that they may be charged for using e-Banking without their knowledge. In this situation, the bank should inform customers prior to debiting their accounts.
- Bank should regularly monitor the ATMs usage and functionality and respond promptly to any technical issues and ensure a consistent supply of cash to avoid downtime.
- Bank must install an ATM in an unserviced or underserved area. It can be an initiative that benefits both the community and the bank.
- Provide comprehensive training to bank employees on the latest security protocols, best practices, and emerging cyber threats to prevent human errors and security breaches.
- Bank should keep the e-banking system and all associated software up to date with the latest security patches and upgrades to address known vulnerabilities and conduct periodic penetration testing to simulate real-world attacks and identify potential vulnerabilities in the e-banking system.

- The bank should grant permission to employees to access only the information necessary for their roles, minimising the risk of internal security breaches.

15.2. Suggestions for Customers:

✧ As per the result of the study Awareness of the scam (threat), security and confidentiality of the Services found to be low with respect to ATM, Credit card, net banking and mobile banking. Therefore, customers should educate themselves on the safety and confidentiality for dealing with e-banking, so that the bank or third party cannot exploit them.

✧ As per the key findings majority of the users of e-banking are graduates and post-graduates, they can encourage and educate their other family members to adopt e-banking which will give them convenient banking experience.

✧ Based on the findings that the adoption of e-banking services significantly contributes to customer satisfaction when mediated by banking strategies, and that customer satisfaction is influenced by the level of issues and challenges faced, the following suggestions can be provided to e-banking customers:

- The customers must familiarize them with e-banking strategies. they should Take the time to understand the various strategies employed by bank to enhance e-banking services. This can include features like user-friendly interfaces, personalized experiences, and efficient customer support. Being aware of these strategies will help them to make the most of their e-banking experience.
- The customers must opt for banks with robust customer support. They should choose banks that provide reliable customer support for e-banking services. This can be in the form of 24/7 helplines, live chat support, or dedicated customer service teams. Having access to prompt assistance will ensure that any issues or challenges you face are addressed quickly, enhancing satisfaction.
- Customers must stay updated on e-banking features. They must regularly explore and familiarize themselves with the new features and functionalities offered by their bank's e-banking services. This can include mobile banking

apps, secure authentication methods, or innovative transaction options. By utilizing these features, they can maximize the benefits of e-banking and improve overall satisfaction.

- Customers must practice good security measures by implementing strong passwords, enabling two-factor authentication, and regularly updating their devices and software. By taking these security precautions, they can minimize the risk of unauthorized access to their accounts, reducing potential challenges and enhancing their satisfaction.
- Customers shall provide feedback to their bank. They should actively communicate their experiences, challenges, and suggestions to their bank. Banks value customer feedback and use it to improve their e-banking services. By sharing their thoughts, you contribute to the future development of e-banking strategies, ultimately benefiting both themselves and other customers.
- Customer must stay informed about their rights and responsibilities. they must educate themselves about the rights and responsibilities associated with e-banking. They should also understand the terms and conditions, transaction limits, and liability policies set by their bank. This knowledge will empower them to navigate e-banking services effectively and address any challenges that may arise.
- Most importantly, customer must seek financial literacy resources and take advantage of financial literacy resources provided by their bank or other reliable sources. Enhancing your financial knowledge and understanding will enable them to make informed decisions, utilize e-banking services optimally, and minimize potential challenges.

✧ General suggestions to customer for enhancing e-banking experience and ensure a secure financial journey:

- The customer should enable two-factor authentication whenever possible. This adds an extra layer of security by requiring a second form of verification, such as a one-time password sent on the phone, in addition to the password.

- Customers should refrain from conducting sensitive banking transactions while connected to public Wi-Fi networks, as they may be vulnerable to hackers. Use a secure and private internet connection for such activities.
- Customers should regularly review account statements and transaction histories, and if they notice any suspicious activity, report it to the bank immediately.
- Download the bank's official mobile app from a trusted source and keep it updated. Avoid using third-party apps for banking purposes.
- The customer should Keep contact information up-to-date with the bank so they can reach them if any unusual activity is detected.

15.3. Suggestions for Government and Public:

As a suggestion to the government regarding e-banking, here are some key areas to focus on to promote the growth and security of electronic banking services and regulate e-banking to ensure its effectiveness, security, and accessibility for the public. Here are some suggestions:

- ✧ Foster collaboration between the government, financial institutions, and cybersecurity experts to share information about emerging threats and best practices. This collaboration can lead to innovative solutions for strengthening the e-banking ecosystem.
- ✧ The government should take the initiative to ensure that e-banking services are accessible to all citizens, including those with disabilities and those in remote areas. Encourage the development of user-friendly interfaces and support alternative methods of accessing e-banking, such as toll-free helplines.
- ✧ The government should collaborate with banks and financial institutions to develop advanced fraud prevention measures, including real-time transaction monitoring and early warning systems.
- ✧ The government should strengthen data protection laws and ensure strict compliance by banks and other financial entities. Implement penalties for data breaches to encourage better security practices.
- ✧ The Government must integrate e-banking with various government services, making it more convenient for citizens to pay taxes, fees, and utility bills securely through E-banking channels.

16. RECOMMENDATION FOR FURTHER RESEARCH

- Further study in this domain can be conducted on other geographical locations and populations by considering the same model to assess customers and bankers' perception on e-banking.
- As there is rapid growth of technology and advancement in e-banking which has evolved the concept of fintech, further studies can be conducted to address employees' perception on fintech and its influence on bank performance and their advancement.
- Moreover, future studies can be undertaken to address the role of block chain and artificial intelligence in protecting or threatening customer privacy and improving banking accuracy.

17. CONCLUSION

Present study was an attempt to analyze various prospects and challenges of e-banking from the point of view of customers and bankers. Digging more into these aspects dragged the researcher's attention towards various aspects which may influence the adoption of e-banking. As a result, current research assessed the impact of awareness on e-banking adoption further analyzed customer challenges and satisfaction pertaining to e-banking adoption and their view on future development was collected. As per the results it was discovered that awareness plays a vital role in the adoption of e-banking services through various influential banking strategies. Moreover, it was also witnessed that adoption of e-banking provides more customer satisfaction but there are various challenges customer face due to which their satisfaction level is affected. These challenges draw customer's attention towards further improvement in the e- banking services which they themselves recommend which can be a significant tool for banks to adopt innovative strategies for s wider reach of customer base and sustainable growth in the competitive environment. Hence, this study is quite significant for a banking concern to address the challenge faced by the customers to improve their banking experience by considering their recommendation on future development of e-banking services.

18. REFERENCES

Adholiya, A., & Adholiya, S. (2019). A Study on Cyber Security Practices and Tips Awareness among E-Banking Services Users of Udaipur, Rajasthan. *Int. J. Sci. Res. in Multidisciplinary Studies* Vol, 5(8).

Ahmad, I., Iqbal, S., Jamil, S., & Kamran, M. (2021). A systematic literature review of e-banking frauds: Current scenario and security techniques. *Linguistica Antverpiensia*, *2*(2), 3509-3517.

Akhisar, I., Tunay, K. B., & Tunay, N. (2015). The effects of innovations on bank performance: The case of electronic banking services. *Procedia-Social and Behavioral Sciences*, *195*, 369-375.

AlAbdullah, Fadhel & Alshammari, Fahad & Alnaqeib, Rami & Jalab, Hamid & Zaidan, A. & Bahaa, Bilal. (2010). Analytical Study on Internet Banking System. *Journal of Computing*, 2(6), 140-146. https://sites.google.com/site/journalofcomputing/www.journalofcomputing.org

Ali, M., Kalwar, M. A., & Khan, M. A. (2021). Infrastructural Challenges of E-Banking as per CustomersPerspective: Detailed Analysis Across ParticipantsGender and Age. *International Journal of Business Education and Management Studies*, *5*(1), 58-82.

Alsmadi, A. A., Sha'ban, M., & Al-Ibbini, O. A. (2019, February). The Relationship between E-banking Services and Bank Profit in Jordan for the Period of 2010-2015. *In Proceedings of the 2019 5th International Conference on E-Business and Applications*, 70-74.

Ananda, S., Devesh, S., & Lawati, A. M. A. (2020). What factors drive the adoption of digital banking? An empirical study from the perspective of Omani retail banking. *Journal of Financial Services Marketing*, 25(1–2), 14–24. https://doi.org/10.1057/s41264-020-00072-y

Ansari, S. J., & Khan, N. A. (2017). E-Banking in India: Progress and challenges. *International Journal of Innovative Research and Advanced Studies*, *4*(8), 334-340.

Applegate, D. L., Bixby, R. E., Chvatál, V., & Cook, W. J. (2006). *The Traveling Salesman Problem: A Computational Study.* Princeton University Press. http://www.jstor.org/stable/j.ctt7s8xg

Arshad Khan, M., & Alhumoudi, H. A. (2022). Performance of E-banking and the mediating effect of customer satisfaction: a structural equation model approach. *Sustainability*, *14*(12), 7224.

Ayinaddis, S.G., Taye, B.A. & Yirsaw, B.G. (2023). Examining the effect of electronic banking service quality on customer satisfaction and loyalty: an implication for technological innovation. *J Innov Entrep* 12:22, 1-18.

Baptista, G., & Oliveira, T. (2016). A weight and a meta-analysis on mobile banking acceptance research. *Computers in Human Behavior*, 63, 480–489. https://doi.org/10.1016/j.chb.2016.05.074

Baten, Md Azizul & Kamil, Anton Abdulbasah. (2010). E-Banking of Economical Prospects in Bangladesh. *Journal of Internet Banking and Commerce*. 15. 1-10.

Bhai, D.L. (2018). E-Banking in India-Problems and Prospects. *International Journal of Current Engineering and Scientific Research (IJCESR), 5(1), 77-81.*

Camara, A., Rahim, M. Z. B. A., Yusof, Y. B., Tambi, A. M. B. A., & Magassouba, S. M. (2019). The effect of automation and workload on staff productivity in under developing country in Guinea: A conceptual study. *International Journal of Academic Research in Business and Social Sciences*, *9*(3), 902-914.

Campbell, D., & Frei, F. (2010). Cost structure, customer profitability, and retention implications of self-service distribution channels: Evidence from customer behavior in an online banking channel. *Management Science*, *56*(1), 4-24.

Carranza R, Díaz E, Sánchez-Camacho C and Martín-Consuegra D (2021) e-Banking Adoption: An Opportunity for Customer Value Co-creation. *Front. Psychol*. 11:621248. doi: 10.3389/fpsyg.2020.621248

Chaimaa, B., Najib, E., & Rachid, H. (2021). E-banking overview: concepts, challenges and solutions. *Wireless Personal Communications*, *117*, 1059-1078.

Chaudhari, A., Patil, M., & Sonawane, M. (2014). A Study on Awareness of E-Banking Services in College Students of Bhusawal City. *International Journal of Innovative Research & Development*, 3(1), 219-224.

Claessens, S., Glaessner, T., & Klingebiel, D. (2002). Electronic Finance: Reshaping the Financial Landscape Around the World. *Journal of Financial Services Research 22*, *22*, 29–61. https://doi.org/10.1023/A:1016023528211

Cui, X., & Xu, J. (2022). Understanding the E-banking channel selection behavior of elderly customers: A small-world network perspective. *Journal of Organizational and End User Computing (JOEUC)*, *34*(6), 1-21.

Dakshina Kannada District Website. Retrieved from: https://dk.nic.in/en/ on 12/08/2022

Daniel, E.M., & Storey, C. (1997). On-line banking: Strategic and management challenges. *Long Range Planning*, 30, 890-898.

Devi, P. A., & Malarvizhi, V. (2010). Customers' Perception of E-Banking: Factor Analysis. *IUP Journal of Management Research*, *9*(6), 7.

Dhananjay, B., & Ch, S. (2015). The electronic banking revolution in India. The Journal of Internet Banking and Commerce, 20(2).

Drigă, I., & Isac, C. (2014). E-banking services–features, challenges and benefits. *Annals of the university of Petrosani. Economics*, *14*, 49-58.

Evian, M., Limijaya, A., & Hutagaol-Martowidjojo, Y. (2021, August). An analysis on the effect of E-banking on bank performance in indonesia. In *2021 International Conference on Information Management and Technology (ICIMTech)* (Vol. 1, pp. 187-192). IEEE.

Fliginskih, T. N., Vaganova, O. V., Solovjeva, N. E., Bykanova, N. I., Ragheed, Y., & Usatova, L. V. (2020). The impact of e-banking on performance of banks: Evidence from Russia. *Journal of Advanced Research in Dynamical and Control Systems*, *12*(S4), 231-239.

Gardner, J. A. (2011). *Innovation and the future proof bank: A practical guide to doing different business-as-usual*. John Wiley & Sons.

Glaessner, T. C., Kellermann, T., & McNevin, V. (2003). *Electronic Security: Risk Mitigation in Financial Transactions: Public Policy Issues* (Vol. 2870). World Bank Publications.

Glavee-Geo, R., Shaikh, A. A., & Karjaluoto, H. (2017). Mobile banking services adoption in Pakistan: are there gender differences? *International Journal of Bank Marketing*, *35*(7), 1090–1114. https://doi.org/10.1108/ijbm-09-2015-0142

Gupta, S., & Yadav, A. (2017). The impact of electronic banking and information technology on the employees of banking sector. *Management and Labour Studies*, *42*(4), 379-387.

Hailu, M. (2019). *An Assessment On Benefits and Risks Of E Banking On Customer Saving: In The Case Of Cbe Under North Addis Ababa District* (Doctoral Dissertation, St. Mary's University).

Hamidi, H., & Safareeyeh, M. (2019). A model to analyze the effect of mobile banking adoption on customer interaction and satisfaction: A case study of m-banking in Iran. *Telematics and Informatics, 38*, 166-181. https://doi.org/10.1186/s13731-023-00287-y

Indian Institution of Banking and Finance. (2016). Digital banking. *Taxmann Publication (P.) Ltd.*

Inegbedion, H., Inegbedion, E. E., Osifo, S. J., Eze, S. C., Ayeni, A., & Akintimehin, O. (2020). Exposure to and usage of e-banking channels: Implications for bank customers' awareness and attitude to e-banking in Nigeria. *Journal of Science and Technology Policy Management*, *11*(2), 133-148.

Isibor, A. A., Omankhanlen, A. E., Okoye, L. U., Achugamonu, B. U., Adebayo, M. E., Afolabi, G. T., & Ayodeji, O. E. (2018). Impact of electronic banking technology on customers' satisfaction and economic growth in Nigeria. *International Journal of Civil Engineering and Technology*, *9*(12), 536-544.

Jegan, P., & Gnanadhas, M. D. (2011). Job satisfaction of bank employees working with e-channels. *Asian journal of business and economics*, *1*(11), 1-8.

Johnson, M., & Moore, S. (2007, October). A new approach to e-banking. In *Proc. 12th Nordic Workshop on Secure IT Systems (NORDSEC 2007)* (pp. 127-138).

Jouzdani, J., Shirouyehzad, H., Maaroufi, N., & Javaheri, A. (2020). Identification, ranking and clustering of electronic banking services based on customer satisfaction: case study in bank industry. *International Journal of Services, Economics and Management*, 11(2), 167-190.

Kalakota, R., & Robinson, M. (1999). E-business: Roadmap for success. addison-Wes1ey. *Reading, MA*.

Kato, C. I. (2019). Legal framework challenges to e-banking in Tanzania. *PSU Research Review*, *3*(2), 101-110.

Khalfan, A. M., & Alshawaf, A. (2004). Adoption and implementation problems of e-banking: A study of the managerial perspective of the banking industry in Oman. *Journal of global information technology management*, 7(1), 47-64.

Khattab, I., Ahmed, A. M., & Al-Magli, O. A. O. (2020). The implications of e-banking channels on job security and personal development. *Banking & Financial Studies*, (35), 9-39.

Khattab, I., Mohmed Ahmed, A., & Al-Magli, O. O. (2019). The Effect of E-banking Channels on Employees' Daily Activities and Workload.

Krishnakumar, K., & Selvam, V. (2011). An Empirical Study on Factors Influencing E- Banking Services: With Special Reference to ICICI Bank in Gobichettipalayam Town. *International Journal of Multidisciplinary Research, 1*(6), 131–146.

Lasmini, R. S., Budiarti, A. P., Tasman, A., & Susant, F. A. (2020, March). The relationship between E-banking and financial performance of go public bank in indonesia. In *4th Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2019)* (pp. 903-909). Atlantis Press.

Lewis, B. R. (1991). Service quality: an international comparison of bank customers' expectations and perceptions. *Journal of marketing management*, 7(1), 47-62.

Lockett, A., & Littler, D. (1997). The adoption of direct banking services. *Journal of Marketing Management*, *13*(8), 791–811. https://doi.org/10.1080/0267257x.1997.9964512

Lymperopoulos, C., & Chaniotakis, I. E. (2004). Branch employees' perceptions towards implications of e-banking in Greece. *International Journal of Retail & Distribution Management, 32*(6), 302-311.

Malaquias, R. F., & Hwang, Y. (2016). An empirical study on trust in mobile banking: A developing country perspective. *Computers in Human Behavior,* 54, 453–461. https://doi.org/10.1016/j.chb.2015.08.039

Mansyur, M. (2021). Marketing opportunities for bank syariah mandiri e-banking services as a payment method. *Research Horizon, 1*(2), 71-80.

Melnychenko, S., Volosovych, S., & Baraniuk, Y. (2020). Dominant ideas of financial technologies in digital banking. *Baltic journal of Economic studies*, *6*(1), 92-99.

Messabia, N., Doheir, M., Mahmoud, A., Bin Hasan Basari, A. S., Abu Selmiya, N., & Sayed, A. A. (2019). Adoption of Cloud Computing model for Managing e-Banking System in Banking Organizations. *International Journal of Advanced Science and Technology*, *28*(1), 318-326.

Mu, Y. (2003). E-Banking: Status, Trends, Challenges and Policy Implications. *www.ssrn.com*. CBRC Seminar the Development and Supervision of E-banking, Shanghai, China. https://doi.org/10.2139/ssrn.485343

Nagar, N., & Ghai, E. (2019). A Study of Bank Customer's Reliability towards Electronic Banking (E-Banking) Channel's. *International Journal of Management Studies*, 6, 34-40.

Nazaritehrani, A., & Mashali, B. (2020). Development of E-banking channels and market share in developing countries. *Financial Innovation, 6*(1), 12.

Nduta, R. W., & Wanjira, J. (2019). E-banking strategy and performance of commercial banks in Kenya. *International Journal of Current Aspects*, *3*(V), 147-165.

Nigudge, S., & Pathan, M. K. A. (2014). E-banking: services, importance in business, advantages, challenges and adoption in India. *Asian Journal of Management Sciences*, *2*(3), 190-192.

Nitsure, R. R. (2003). E-banking: Challenges and Opportunities. *Economic and Political weekly*, 5377-5381.

Obeng-Ayisi, Emmanuel & Quansah, Charles & Mensah, Ronald & Acquah, Andrews. (2022). An Investigation into Factors Impacting on Customer Decision to Adopt E-Banking: Viewpoints of GCB Customers. Technium Social Sciences Journal. 33. 357-371. 10.47577/tssj.v33i1.6572.

Pambudi, A., Widayanti, R., & Edastama, P. (2021). Trust and acceptance of E-banking technology effect of mediation on customer relationship management performance. *ADI Journal on Recent Innovation*, *3*(1), 87-96.

Parameswar, N., Dhir, S., & Dhir, S. (2017). Banking on innovation, innovation in banking at ICICI bank. *Global Business and Organizational Excellence*, 36(2), 6-16.

Pathania, K. S., & Sharma, M. (2010). Adoption of banking technology. *The Indian Journal of Commerce, 63*(3), 87–91.

Poon, W. C. (2008). Users' adoption of e-banking services: The Malaysian perspective. *Journal of business & industrial marketing*, 23(1), 59-69.

Rahi, S., Ghani, M. A., & Ngah, A. H. (2020). Factors propelling the adoption of internet banking: the role of e-customer service, website design, brand image and customer satisfaction. *International Journal of Business Information Systems, 33*(4), 549-569.

Rahman, M. (2022). Designing A Cross Platform Mobile Wallet Service for Bangladesh-A Service Design Approach in A Developing Country.

Ramesh, V., Jaunky, V. C., Roopchund, R., & Oodit, H. S. (2020). 'Customer satisfaction', loyalty and 'adoption'of e-banking technology in Mauritius. In *Embedded Systems and Artificial Intelligence: Proceedings of ESAI 2019, Fez, Morocco* (pp. 861-873). Springer Singapore.

Ramudu, J & Rao, D. (2006). A Fundamental Analysis of Indian Banking Industry. *The ICFAI Journal of Bank Management*, 5(4), 68-79.

Revathi, P. (2019). Digital banking challenges and opportunities in India. EPRA International Journal of Economic and Business Review, 7(12), 20-23.

Rexha, N., Kingshott, R.P.J. & Shang Shang Aw, A. (2003). The impact of the relational plan on adoption of electronic banking, *Journal of Services Marketing, 17*(1), 53-67. https://doi.org/10.1108/08876040310461273

Sardana, S., & Bajpai, V. N. (2020). E-banking service quality and customer satisfaction: An exploratory study on India. *International Journal of Services and Operations Management*, *35*(2), 223-247.

Saxena, N., Gera, N., Nagdev, K., & Fatta, D. D. (2021). A conjoint analysis of customers' preferences for e-banking channels. *International Journal of Electronic Marketing and Retailing*, *12*(1), 52-68.

Shafei, R., & Sijanivandi, S. (2022). The Intra-Sectional Marketing Maturity and the E-Banking Market Share; Involvement of other Units in Marketing Activities. *Marketing Science and Technology Journal*, *1*(1), 13-28.

Shah, M., & Clarke, S. (2009). *E-Banking Management: Issues, Solutions, and Strategies* (1st ed.). Information Science Reference. 1.

Shah, S. & Aziz, J. & Jaffari, A.R. & Waris, Sidra & Ejaz, W. & Fatima, M. & Sherazi, Syed. (2012). The impact of brands on consumer purchase intentions. *Asian Journal of Business Management.* 4. 105-110.

Shankar, A., Jebarajakirthy, C., & Ashaduzzaman. (2020). How do electronic word of mouth practices contribute to mobile banking adoption? *Journal of Retailing and Consumer Services*, 52, 101920. https://doi.org/10.1016/j.jretconser.2019.101920

Sharma Himani (2011). Bankers' Perspective on E-Banking, NJRIM, Volume I.

Singh, S., & Srivastava, R. (2020). Understanding the intention to use mobile banking by existing online banking customers: an empirical study. *Journal of Financial Services Marketing*, 25(3–4), 86–96. https://doi.org/10.1057/s41264-020-00074-w

SLBC Karnataka. (2022). https://slbckarnataka.com/Banking.aspx

Sohail, M. and Shanmugham, B. (2003) E-Banking and Customer Preferences in Malaysia: An Empirical Investigation. Information Sciences, 150, 207-217. https://doi.org/10.1016/S0020-0255(02)00378-X

Syed AA, Kamal MA, Ullah A, Grima S. (2022) An Asymmetric Analysis of the Influence That Economic Policy Uncertainty, Institutional Quality, and Corruption Level Have on India's Digital Banking Services and Banking Stability. Sustainability, 14(6):3238. https://doi.org/10.3390/su14063238

Takieddine, S., & Sun, J. (2015). Internet banking diffusion: A country-level analysis. Electronic Commerce Research and Applications, 14(5), 361-371.

Toufaily, E., Daghfous, N., & Toffoli, R. (2009). The adoption of" E-banking" by Lebanese banks: Success and critical factors. *International Journal of E-Services and Mobile Applications (IJESMA)*, 1(1), 67-93.

United Nations Publications. (2021). *Digital Economy Report 2021: Cross-border data flows and development: From whom the data flow*. https://unctad.org/system/files/official-document/der2021en.pdf

Uppal, R. K. (2021). *Electronic banking in india* (First ed.). Swastik publication.

Vishnuvardhan, B., Manjula, B., & Lakshman Naik, R. (2020). A study of digital banking: Security issues and challenges. In *Proceedings of the Third International Conference on Computational Intelligence and Informatics: ICCII 2018* (pp. 163-185). Springer Singapore.

Warkentin, M., Charles-Pauvers, B., & Chau, P. Y. (2015). Cross-cultural IS research: perspectives from Eastern and Western traditions. *European Journal of Information Systems*, 24(3), 229-233.

Whyte, W. S. (2001). *Enabling eBusiness: Integrating technologies, architectures and applications*. John Wiley & Sons.

Yang, A. S. (2009). Exploring adoption difficulties in mobile banking services. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, *26*(2), 136-149.

Yang, J., Cheng, L., & Luo, X. (2009). A comparative study on e-banking services between China and USA. *International Journal of Electronic Finance*, *3*(3), 235–252. https://doi.org/10.1504/IJEF.2009.027848

Yap, K. B., Wong, D. H., Loh, C., & Bak, R. (2010). Offline and online banking–where to draw the line when building trust in e-banking?. International Journal of Bank Marketing, 28(1), 27-46.

Yousafzai, S. Y., Pallister, J. G., & Foxall, G. R. (2005). Strategies for building and communicating trust in electronic banking: A field experiment. *Psychology & Marketing*, *22*(2), 181-201.

Zewdu, H. (2019). *Assessment of The Challenges and Benefits of ATM Banking Service (The Case of Commercial Bank of Ethiopia)* (Doctoral Dissertation, St. Mary's University).

Zhao, F., Shen, K. N., & Collier, A. (2014). Effects of national culture on e-government diffusion—A global study of 55 countries. *Information & Management*, 51(8), 1005-1016.